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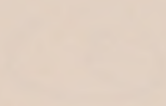


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THE INCIDENCE OF GOVERNMENT REVENUES AND EXPENDITURES

by JAMES A. JOHNSON

A study prepared for
The Ontario Committee on Taxation



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Preface and Acknowledgments

This study is one of several that were commissioned by The Ontario Committee on Taxation to aid it in its deliberations. In addition to the use made of this work by the Committee, it is hoped that this study will be of interest to university teachers and students, civil servants and others who work and read in the public finance area. In order to make the scope of readership as large as possible, an attempt has been made to keep the technical terms to a minimum. Where it was felt that technical terms must be used, they were defined and an attempt was made to confine the analysis to a fairly elementary level.

Although there have been several studies in the United States that attempt to measure the redistribution of income among income classes that occurs as a consequence of government revenue and expenditure programs, very little research of this nature has been undertaken in Canada. To the best of my knowledge there are only two other studies of this nature based on Canadian statistics. The first study on this topic in Canada was undertaken by Professor Irving Goffman for the Canadian Tax Foundation (Irving J. Goffman, *The Burden of Canadian Taxation*, Canadian Tax Foundation, Toronto, 1962). Although Professor Goffman's study is an excellent contribution to literature, it is limited to an examination of the impact of government revenues on various income classes. The second Canadian study was undertaken by Professor W. Irwin Gillespie for the Royal Commission on Taxation. This study, which is soon to be published, examines the impact of both revenues and expenditures on the distribution of family income in Canada. However, since Professor Gillespie was concerned primarily with the federal revenues and expenditures and consequently with the entire country, he did not take account of the differences that might arise among the provinces. For example, if one province has higher tax rates than the others, the tax burden on the families in that province would likely be higher than the burdens on families residing in other provinces. This Ontario study is designed to measure the impact of Canadian revenues and expenditures on the distribution of family income in the province. However, since there was an exchange of studies and information between the federal commission and the Ontario committee, it was decided to make this study complementary to the federal study by adopting as much as possible the same definitions, time periods and sources of data. Although this decision did place some restrictions on the analysis, there is a gain to readers of both studies in that the studies can be more readily compared than if the definitions, sources of data and time periods were different.

In the course of conducting this study I have received the help of several individuals. In the following paragraphs, I have attempted to acknowledge those who have made substantial contributions to my work.

I owe most to Professor W. I. Gillespie of the Royal Commission on Taxation. He not only saved me many man-months of work by introducing me to many sources of data that were relevant to the analysis but he also suggested various techniques for estimating data that were not available in the desired form or for the desired time period. In addition, he served as a sounding-board for many of my ideas.

I am indebted to Professor Robert M. Clark for suggesting the topic to the Committee and for his encouragement in the early stages of my research.

There are several individuals, primarily civil servants, who went to a great deal of effort to supply me with data. The most notable in this regard are: J. R. Podoluk, I. McWhinney, E. B. Carty, C. D. Blyth, R. W. James, D. Richmond, S. J. Kelly, S. Clasky, J. Weldon, W. B. Bolton, R. E. F. Jones, and N. F. Sprott.

J. R. Allan, R. C. McIvor, L. J. Smith, H. R. Hanson, F. W. Hurst, and J. S. Dupré did me great service by reading parts of an earlier draft and making suggestions for improving it.

Last, I am indebted to Miss M. J. Coulthard for her careful typing of the manuscript.

Any errors in the study are, of course, my responsibility.

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CHAPTER 1

The Incidence of Government Revenues and Expenditures

INTRODUCTION

THERE is general agreement that government revenue and expenditure programs have a substantial impact on the distribution of income, but the magnitude of this impact is usually unknown. The detailed effects of government fiscal activity¹ are difficult to ascertain because of inadequate statistics and a lack of well-developed economic theory. Nevertheless the distributional effects of government fiscal activity must be estimated in order to evaluate alternative combinations of revenue and expenditure programs. Thus, the chief purpose of this study is to examine the impact of government fiscal activity on the distribution of family income in Ontario. This is accomplished by first classifying families according to their income. Revenues and expenditures are then allocated to families. This allocation is made on the basis of the incidence assumptions we adopt in regard to each revenue and expenditure item. Next, the revenues and expenditures allocated to families in each income class are divided by the income in the class. This enables us to determine by level of income:

- (1) the percentage of income paid in the form of taxes and other charges,
- (2) the proportion of total income due to government expenditures, and
- (3) the net effect of government fiscal activity on income.

USES OF THE RESULTS

There are several uses that can be made of these results. First, the magnitude of the redistribution of income caused by government expenditure and revenue programs can be determined. This gives an indication of the ability of government to redistribute income. For example, if the combined effect of revenue and expenditure programs is to redistribute \$4 billion, the government's ability to alter the distribution of income is likely to be much larger than if only \$200 million changes hands as a result of government fiscal activity.

Second, the results of our investigation indicate the pattern of redistribution that results from government fiscal activity. This allows judgment to be made as to whether government's impact on the income distribution is equitable. For example, if it is judged that equity can best be served by a reduction in income inequalities, our results indicate the extent to which government fiscal activity meets this concept of equity.

Third, the impact of individual taxes and expenditures can be compared and evaluated. Although it is the effect of all revenues and expenditures that is important in evaluating the impact of government, knowledge of the effect of individual revenue and expenditure items is useful when considering whether one item should be substituted for another, or in determining which item should be increased or

reduced. For example, if the government intends to raise more revenue from either the sales tax or the personal income tax, the impact of each tax on the income distribution is an important consideration in selecting one of the two levies.

Fourth, these results help in making international comparisons of revenue and expenditure structures. For example, international comparisons of tax burdens are frequently made. From our results, and those obtained from similar studies conducted in other countries, a comparison of tax burdens and the combined revenue-expenditure impact on income can be made by income class as well as in total.

PROBLEMS AND SCOPE OF THE STUDY

The scope of this study is determined by the decisions that are made on many separate questions. Many of these questions are solved, not on the basis of what is optimal, but rather on what is feasible. There are both theoretical and empirical difficulties that tend to limit our investigation. Many of these problems are discussed in the succeeding chapters and the appendixes, but we explore some of the basic questions in this section of the study.

One problem is determining the proper base for measuring the impact of government on individuals. Ideally, we would like to measure changes in the well-being of individuals that result from government activity. This concept is impossible to measure because an individual's well-being depends on many factors, some of which are intangible. However, even disregarding all considerations except those of an economic nature, some difficulty remains. An individual's economic position at a particular time depends chiefly on his wealth position. But statistics are not available either on the distribution of wealth or on the relationship between government revenues and wealth. Thus we have adopted current income as the basis of measuring the economic position of individuals. We have adopted this concept for several reasons. First, the necessary data relating revenues and expenditures to current income are available. Second, current income is related, albeit imperfectly, to wealth. Third, current income is frequently used as a basis for measuring the ability to pay tax and the impact of government fiscal activity.

There is a set of problems that relate to the measurement of the impact of government. It is argued by some that government's action in areas such as international trade, collective bargaining, the supply of money and the structure of various industries affects the distribution of income and that an examination of revenues and expenditures only indicates a portion of the redistributive impact of government. We grant that this argument is true, but an investigation into the total redistribution of income by government is not attempted here, both because it would take more resources than we have available and because there is not sufficient statistical material in existence. In addition, effects of fiscal activity are of particular importance because revenue and expenditure decisions have a much more direct impact on the distribution of income than policy decisions in other areas of government influence.

A more serious criticism for studies of this nature is that we cannot determine the impact of fiscal activity because we do not know what the distribution of income would be in the absence of government.² This is partly because the expansionary

effects of expenditures and contractionary effects of revenues change the distribution as well as the level of income. It is further argued that even if the level of income remains constant, revenues and expenditures alter patterns of production and demand through their effects on such factors as the desire to work and to invest. These effects on productive resources alter the distribution of income. For example, an income tax may reduce work effort, causing a shift to the use of machinery. This shift may lower the amount of wages paid and increase the amount of investment income.³ We recognize the validity of these criticisms, but since it is impossible to conduct the experiment of removing all revenues and expenditures we cannot ascertain the distribution of income that would exist in the absence of government. Thus, we assume that government only reduces individual incomes by an amount equal to the government revenues paid and adds to incomes by an amount equal to the expenditures received. This means that we neglect any distributional changes caused by the impact of government fiscal activity on the total amount of income⁴ and on the supply of productive resources. Thus we assume that the distribution of other sources of income such as wages and salaries, return on investments, and return on farming are not affected by government fiscal activity.

Another difficulty is in determining the government units that should be included in the investigation. There are several approaches that can be taken in solving this problem—many of which have been adopted in similar studies. All approaches would include the Ontario provincial and municipal revenues and expenditures, but the other government units to be encompassed depend on the purpose of the investigation. Four possible approaches to the problem are discussed below.

One possibility is to include only the Ontario provincial and municipal governments and to allocate all of these revenues and expenditures to Ontario residents.⁵ This approach could be defended by arguing that the activities of other government units are beyond the influence of Ontario, and thus are unimportant in designing the revenue and expenditure structure of the province. The exclusion of governments that do not have jurisdiction over Ontario residents might also be justified if the Ontario revenues and expenditures exported outside the province are equal to the amounts imported.

A second approach is to reduce the Ontario receipts and expenditures by the amount that the Ontario fiscal activity changes federal revenues and expenditures. Changes in federal revenues and expenditures could occur in several ways. For example, the imposition of a property tax reduces corporate profits thereby reducing the federal corporate tax liability. Thus there are some corporate tax savings that should be subtracted from the Ontario property tax receipts to obtain the net burden of the property tax. Similarly, some of the federal transfer payments, such as aid for dependent children, depend on provincial payments. This is an appropriate approach to select if it can be assumed that the federal structure is in existence before the provincial and the object of the study is to measure the net cost and gain of provincial revenues and expenditures.

A third approach is to reduce the Ontario revenues and expenditures allocated to Ontario residents by the amount that these items are shifted to individuals outside the province.⁶ For example, foreign investors may bear part of the Ontario

corporation tax and tourists benefit from Ontario road expenditures. This adjustment is an appropriate one to make if the purpose of the investigation is to measure the effect of Ontario fiscal activity on Ontario residents.

A fourth approach is to exclude the revenues and expenditures shifted to non-residents and include the revenues and expenditures of all other governments that accrue to residents of the province. This is the proper approach to select if the purpose of the study is to measure the impact of the fiscal activity of all governments on the income distribution in Ontario, and if the revenues and expenditures exported are not equal to the amounts imported.

The approach we have selected is very close to the fourth approach. Our analysis is based on the fiscal activity of all Canadian government units. This encompasses the fiscal activity of the Ontario provincial and municipal governments, the federal government, and the provincial and municipal governments in the nine other provinces. We have included the revenues and expenditures of the federal government and the other provinces because they do affect the income of Ontario residents. An examination of Ontario taxes and expenditures alone would give an incomplete and distorted picture of the impact of government. For example, even if the burden of the Ontario tax structure was judged to be equitable, the combined federal-provincial-municipal burden may be considered inequitable. The effect of the Ontario revenues and expenditures can be evaluated adequately only in the context of the total impact of government fiscal activity on the income distribution in Ontario. Thus, the fiscal activity of other governments should be included even if they cannot be influenced by Ontario. However, the distribution of powers and functions in Canada along with the high proportion of the country's population and income in Ontario gives weight to the belief that Ontario can exercise some influence on the revenue and expenditure programs of other governments. This gives additional support for including other Canadian governments in our analysis. The impact of the other provinces and their municipalities on Ontario residents is investigated because the amounts of Ontario revenues and expenditures exported to the rest of Canada are not likely to be equal to the amounts imported. This is because the level of income is higher in Ontario than elsewhere in the country and because the composition of Ontario revenue and expenditure programs is different from those of any other province.

We do not include the fiscal activity of other governments outside Canada, however. This is partly because it is impossible, with the resources currently available, to determine statistically the share of foreign taxes and expenditures that accrue to Ontario residents. To estimate the effects of foreign fiscal activity it would be necessary to examine the production patterns, industrial structure and foreign trade as well as the tax and expenditure programs of all of Canada's trading partners. In addition, the fiscal activities of foreign governments are generally so far removed from the scope of Canadian influence it is questionable whether the effects of these foreign programs should be included even if it were statistically possible.

The last basic problem discussed in this section is the manner in which Ontario residents are to be ranked by income. For the purpose of our investigation we have attempted to solve this problem by classifying Ontario residents two ways.

They are first grouped into families and unattached individuals.⁷ One reason for this grouping is that often incomes earned by individual family members are pooled together and expenditures are made as a result of a family rather than an individual decision. For example, housing is a family expenditure, consequently the property tax is a family burden. Similarly, road expenditures tend to benefit families since the purchase of a car is normally a family decision. Thus, many government revenues and expenditures can more appropriately be allocated to families than to individuals. A second reason for this classification is that many of the data underlying the study are in family terms rather than in individual or per-capita terms. Placing these data on a per-capita basis would decrease the reliability of our results.⁸ Families are then grouped by income class. They are placed in specific income classes so that the computations are less burdensome. This again is because many of the basic data are categorized by income class.

Now that we have made explicit some of the assumptions that define the scope of the study, we can be more precise in explaining our objectives. The chief focus of our investigation is on the following questions:

- (1) What percentage of income is paid in revenue to Canadian government units by an average Ontario family⁹ in each income class?
- (2) What proportion of income received by an average Ontario family in each income category is due to expenditures of all governments in Canada? and
- (3) What is the net effect of total Canadian fiscal activity on the income of an average Ontario family in each income class?

In answering these questions we divide the remaining portion of the study into five additional chapters and two appendixes. The second chapter is devoted to developing the income base that is used to compute the rates of taxation and expenditure. This chapter has two parts. In the first part we attempt to develop an income concept that provides the best basis of computing the effects of government fiscal activity. There are several income concepts that could be used for this purpose. We discuss five of the most plausible concepts and explain why we have selected one of these over the others. In the second part we empirically construct the income concept that we believe to be the best for our purposes. This is accomplished by examining each component of income separately. In this examination we explain how the total is derived for Ontario, and the basis for allocating the total among the income classes. The total income accruing to the families in each income class is then obtained by summing the amounts of each component allocated to the class.

The next chapter is concerned with measuring the impact of taxation on income. The ultimate objective of this chapter is to compute the burden of all Canadian revenues. In computing this burden each revenue is investigated separately. The theoretical part of the investigation involves a discussion of the incidence of the revenue. Various hypotheses regarding the incidence of the levy are examined, and on the basis of economic theory and empirical studies one hypothesis is adopted for our study. Using this hypothesis and other assumptions regarding the distribution of the burden, the portion of each levy borne by Ontario residents is ascertained. This total is again distributed to the various income classes

on the basis of the assumed incidence of the revenue. The total burden borne by families in each income class is then illustrated in tabular and chart form.

Following an examination of tax burdens we turn our attention to the expenditure side of the budget in Chapter 4. This chapter is similar in format to Chapter 3. The selection of expenditure items to be included in the study is discussed. An assumption is then made about the incidence of each expenditure item. On the basis of this assumption, the total and distribution of each expenditure item are determined. Although this point is discussed more fully in Chapter 4, it should be observed here that the results obtained in this part of the study may not be as reliable as those obtained on the tax side because of the rather arbitrary decisions made about the incidence of some expenditures and the lack of statistical data for some. However, an examination of revenues alone involves an implicit assumption regarding the incidence of government expenditures. We judge that the results obtained by our explicit assumptions regarding expenditures are superior to those obtained by studying only the impact of taxation.

In Chapter 5, we examine the net fiscal incidence of government fiscal activity. We combine the results of two previous chapters to determine the net impact of government tax and expenditure programs on the distribution of income in Ontario. This impact is obtained by subtracting the revenue rates from the expenditure rates in each income class. In measuring the net fiscal incidence, the situation when revenues do not equal expenditures is discussed, and three methods of treating this situation are presented. These results are again illustrated in tabular and graphic form for each level of government.

The last chapter summarizes the study and indicates some of the conclusions that can be drawn from the results. In this chapter we discuss which items could be changed in order to have the maximum effect on the income distribution.

The two appendixes deal with the data used in the study. In Appendix "A" we describe the sources of data. We also indicate the procedures used to convert many of the data to a form necessary for our purposes. The limitations of the statistics are also discussed. In addition, we indicate the results of the checks that we made on the reliability of the data. The reader who would like to have the sources of the data in mind when reading Chapters 2 to 5 would be well advised to read this appendix before going on to Chapter 2. Appendix "B" is concerned chiefly with the statistical series used to distribute incomes, revenues and expenditures among income classes. The source of each series is simply listed after presenting the distribution. Nearly all of these series are derived from the publications described in Appendix "A".

DEFINITION OF TERMS

Several terms that we use repeatedly through the study are defined here for the benefit of the reader. In determining the burden of revenues and benefits of expenditures to families in each income class, we refer to *effective rates of revenue and expenditure*. The *effective rate of revenue* in each income class is defined as the ratio of revenue to income in the class. The *effective rate of expenditure* is

defined in a similar manner. In describing the pattern of effective rates among income classes we frequently use the terms *progressive*, *proportional* and *regressive*. We use the term *progressive* when:

- (1) The ratio of revenue to income increases as income increases,
- (2) The ratio of expenditure to income falls when income increases, and
- (3) The ratio of expenditures minus revenue (net fiscal incidence) to income is positive and falls, or negative and rises away from zero as income rises.

The term *regressive* is used in the opposite cases. The term *proportional* is applied when any ratio remains constant when income changes. The usage of these terms means that a progressive tax, a progressive government expenditure and progressive net fiscal incidence all tend to equalize incomes.

In ascertaining the proportion of revenues and expenditures accruing to Ontario residents we find it useful to distinguish between Canadian families residing outside Ontario and families residing in other countries. Thus, we label the former *other Canadian families* and the latter *foreign families*. We use the term *non-resident families* to include both other Canadian and foreign families. We describe the revenues and expenditures for the other nine provinces and their municipalities as *other provincial and municipal revenues and expenditures* and the minor revenues and expenditures in Ontario as *miscellaneous revenues and expenditures*.

FOOTNOTES

¹Fiscal activity refers only to government revenue and expenditure programs and should not be confused with the term "fiscal policy".

²For elaboration of this criticism see Bent Hanson, *The Economic Theory of Fiscal Policy* (London: Alden and Unwin, 1958), Chapter 5.

³For a more thorough discussion of these criticisms see Allen T. Peacock, Ed., *Income Redistribution and Social Policy* (Oxford: Alden Press, 1964), Introduction and Chapter 6; A. R. Prest, "Statistical Calculations of Tax Burdens", *Economica*, August 1955, pp. 234-45; Alfred H. Conrad, "On the Calculation of Tax Burdens", *Economica*, November 1955, pp. 342-8.

⁴The problem of a government deficit or surplus is discussed in Chapter 5.

⁵This is the approach that R. A. Musgrave, J. J. Carroll, L. D. Cook and L. Frane used in their study of the United States, "Distribution of Tax Payments by Income Class: A Case Study for 1948", *National Tax Journal*, Vol. IV, No. 1 (March 1951), pp. 1-48.

⁶Some aspects of the second and third approaches were used by Brownlee in his Minnesota study, and Musgrave and Daicoff in their Michigan study. O. H. Brownlee, *Estimated Distribution of Minnesota Taxes and Public Expenditure Benefits* (Minneapolis: The University of Minnesota Press, 1960); Richard A. Musgrave and Darwin W. Daicoff, "Who Pays Michigan Taxes?", *Michigan Tax Study Staff Papers* (Ann Arbor, 1958), Chapter 4.

⁷The underlying data are given in terms of families and unattached individuals. Since this is a rather cumbersome phrase and the proportion of unattached individuals is small, we will use the term "families" to include both families and unattached individuals.

⁸Dividing family expenditures and incomes by the number in each family would magnify any errors inherent in the original data.

⁹"Average Ontario family" means a hypothetical family that has an income equal to the average income in the class.

CHAPTER 2

Derivation of the Income Base

INCOME CONCEPT

TO DETERMINE whether the tax and expenditure programs are progressive, regressive or proportional, the amount of tax paid or expenditure received is divided by the total income received by the families in the income class. The extent of the progressivity, and in many cases the decision whether the over-all effect is progressive or regressive, depends on the income concept used. There are several definitions of income that could be used in conducting inquiries of this nature.¹ In the following paragraphs we briefly discuss five of the most commonly used concepts of income. There are no universally accepted terms for these income concepts. We have labelled them:

- (1) Family money income,
- (2) Personal income,
- (3) Adjusted personal income,
- (4) Pre-government income, and
- (5) Post-government income.

We have chosen the concept entitled post-government income for our analysis but have constructed it in a manner such that the other four income bases can be readily derived from it. Thus, any interested reader can easily calculate a set of effective tax and expenditure rates based on the income concept he feels is most appropriate.

Family Money Income

This is the concept of income that would be held by most families. It is the total amount of money received by the members of the family. With the exception of the portion withheld for the personal income tax, this income is available to the family to dispose of as it wishes. The major components of family money income are wages and salaries, farm income, investment income, self-employment income, and transfer payments. There are at least two points in favour of using this income concept. First, since this concept of income is very close to the one held by most families, the distributional pattern of tax and expenditure rates are easily understood. Families can readily identify their position on the income scale and can compare the benefits and burdens that accrue to them with those received by families in other income classes. Second, the statistical information on the distribution of the components of money income is likely to be better than for non-money items. This is because family surveys often yield information on the distribution of money income. The chief faults of the money income concept are that it is judged not to be a very good measure of economic welfare and it involves some logical inconsistencies if all revenues and expenditures are distributed to families. These criticisms are discussed in the next four paragraphs.

Personal Income

This concept of income is defined as the sum of all income received by residents of the province. It is a broader concept than family money income since some non-money income items are included. These items encompass the rental value of owner-occupied housing, the services of the banking system, and food and fuel grown and used on the farm. This concept of income includes all income items directly received by families. It might be argued that personal income is a better index of economic welfare or well-being than family money income since it is more inclusive. For example, the return a family receives from investing in its own home adds to its welfare in much the same way as the return obtained from investing in securities. This concept is computed by simply adding these non-money items to family money income.

Adjusted Personal Income

This concept of income is broader than personal income and involves distributing a greater proportion of national income to families than the two previous concepts. For both the personal income and the family money income concepts, some income is assumed to be received and held by business firms rather than distributed to the owners. There are also some income-based revenues paid to government by individuals and firms that are not included in the first two income concepts. The three largest additions to personal income are retained earnings, the portion of the corporation income tax borne by stockholders, and the portion of social insurance levies that rests on workers. The adjusted personal income concept is generally regarded as an improvement over personal income because it is logically more consistent.² We assume that all taxes, including those levied on business firms, ultimately rest on families. Since these tax burdens are allocated to families, consistency demands that the taxes and business retained income also be treated as part of the income of families. In the family money and personal income definitions, wages and salaries are gross of personal income tax payments, but investment income is net of corporation taxes. In this adjusted personal income concept all sources of income are valued gross of taxes.

Pre-Government Income

This concept of income involves estimating the income that would exist in the absence of any government fiscal activity. This is accomplished by subtracting transfer payments and government interest from adjusted personal income. This operation is needed because it is assumed that transfer payments and interest are additions to income that would not take place in the absence of government fiscal activity. The treatment of transfer payments is straightforward, but the treatment of government interest payments depends on whether they are viewed as a transfer payment or as an expenditure for service. If they are viewed as a transfer payment, the case for assuming that they would not exist in the absence of government is much stronger than if they are viewed as a payment for service. We adopt the transfer payment view because this is the treatment given interest in the national accounts.³

Post-Government Income

This is the concept of income used in our analysis. Post-government income is defined as the total income that is received directly or indirectly by families at the current level of government fiscal activity. Post-government income is computed by adding all government expenditures, including transfer and interest payments, and by subtracting all taxes from the pre-government income figure.⁴ As the name implies, this post-government income concept is nearly opposite to the previous income concept. We believe that it is inconsistent to include the benefits of transfer payments but not the benefits from government expenditures on goods and services in the income base. In the pre-government income concept this inconsistency is removed by subtracting transfer and interest payments. In computing post-government income we take the opposite tack. Although both the pre-government and the post-government income concepts are logically consistent we have chosen the latter for several reasons. First, we judge that post-government income is the best measure of the economic welfare received by a family. Taxes are not included because families do not have or enjoy the income that is paid in taxes. Conversely they do enjoy the benefits received from government expenditures and these benefits are similar to receiving higher income. For example, when a municipality provides a garbage collection service the benefit to the family is similar to the benefit that it would receive if it had an increase in income equal to the cost of procuring this service privately. The post-government concept is also chosen over the pre-government concept because the latter is an estimate of the income that would exist in the absence of government and thus is more artificial.

For our purposes, post-government income is judged to be much superior to any of the other three concepts. None of the three gives any weight to government expenditures on goods and services unless the very questionable assumption is made that taxes paid by a family are equal to the expenditures it receives. Besides neglecting the government expenditures on goods and services, the first two income concepts exclude items that should properly be included in an estimate of economic welfare.

ESTIMATION OF THE 1961 ONTARIO DISTRIBUTION OF POST-GOVERNMENT INCOME

Now that we have developed theoretically the income concept used in our analysis we empirically estimate both the total and the distribution of income in Ontario. The computations are made in five steps so that all the income concepts discussed previously are estimated. The first step is to estimate the amount of family income.⁵ This is the sum of wages and salaries (\$7,547 million), military pay and allowance (\$256 million), net farm money income (\$291 million), investment income (\$890 million), net non-farm unincorporated income (\$823 million), private pension income (\$45 million) and transfer payments (\$810 million).⁶ The total for each of these components except pension income is obtained directly for Ontario. The total pension income received by Ontario residents (\$65 million) is estimated by multiplying the total of Canadian pension income (\$158 million) by the ratio of wages and salaries earned by Ontario residents to the total

wages and salaries earned by all Canadians. We also make adjustments in two other income concepts. The basic investment income data include imputed interest (\$73 million), which is deducted to obtain an estimate of money investment income. The wages and salaries component includes the employer and employee contributions to social insurance and government pension plans. The social insurance contributions (\$336 million) are subtracted from wages and salaries both because they are not money income items and because they are compulsory payments. If the payments were made as a result of action taken by employees rather than the government, they could be treated in the same manner as supplementary labour income and included in money income. Since the payments are compulsory, however, we exclude them from this income base. Summing all these money components we obtain an estimate of \$10,692 million as the total family income received by Ontario residents in 1961.

To arrive at an estimate that approximates the D.B.S. definition of personal income, we add four non-money items to the family income total computed above. These four components are: imputed interest, imputed rent, investment income of life insurance companies, and food and fuel grown and consumed on the farm. The imputed interest component is the only amount that is not directly obtainable. This is estimated by multiplying the total interest imputed to Canadians by the ratio of liquid assets held by families in Ontario to the total liquid assets held in Canada. The total of these four non-money items is \$533 million, and our estimate of personal income is \$11,225 million.⁷

Personal income is then adjusted to take account of the income earned and held by corporations as well as the revenues, other than the personal income tax, that are based on income. These adjustments include additions to personal income of retained earnings (\$235 million), the portion of the corporate income tax that is assumed to rest on stockholders (\$239 million), the part of social insurance and government pension contributions assumed to be borne by workers (\$196 million), and the portion of property, natural resources, and miscellaneous taxes that is imputed to recipients of income (\$94 million).

The amount of retained earnings assumed to accrue to Ontario residents is computed in two steps. First, the share imputed to foreigners is subtracted from the total of \$779 million. Since the proportion of Canadian industry that is foreign owned approximates 34 per cent⁸ this figure is used to obtain the foreign share of retained earnings. The Ontario share of retained earnings is assumed to equal the proportion of dividends received in Ontario to total dividends received by Canadians. This percentage of 46 per cent is multiplied by the total Canadian retained earnings of \$514 million to give us a total of \$235 million. This total is distributed to families in proportion to the dividends they receive.⁹

In regard to the corporation income levy it is assumed here and in the next chapter that one-half of the tax is borne by stockholders. The total amount of the tax resting on the residents of Ontario is calculated in three parts. The federal tax imputed to Ontario is calculated in much the same way as retained earnings. The total tax of \$1,232 million is reduced to \$616 million by subtracting the portion shifted forward. This \$616 million total is further reduced to \$406 million by

TABLE 2:1—Distribution of Income, 1961

	Family money income class						Total
	Under \$2,000	\$2,000– 2,999	\$3,000– 3,999	\$4,000– 4,999	\$5,000– 6,999	\$7,000– 9,999	\$10,000 and over
	(millions of dollars)						
Money income							
Wages and salaries.....	105.7	286.8	558.4	1,094.3	2,445.2	2,007.5	1,049.1
Military.....	1.3	9.5	28.9	85.0	68.1	48.6	14.6
Farm.....	5.2	47.7	49.5	42.8	58.2	38.7	14.6
Investment.....	75.7	109.5	52.5	36.5	93.5	178.8	48.9
Non-farm unincorporated income.....	19.8	51.8	78.2	85.6	151.4	149.0	343.5
Private pensions.....	.9	2.5	4.8	9.4	21.1	17.3	287.2
Transfer payments.....	206.1	118.5	79.1	100.0	162.1	112.2	9.0
<i>Total Money Income</i>	414.7	626.3	851.4	1,453.6	2,999.6	2,552.1	1,794.3
							7,547.0
							256.0
							291.0
							890.0
							823.0
							65.0
							820.0
							10,692.0
Imputed elements							
Rent.....	15.5	12.5	16.1	29.7	61.2	47.3	32.7
Interest.....	10.1	5.8	4.8	7.2	17.4	16.1	11.6
Food and fuel on farm.....	17.5	8.0	5.7	3.8	4.0	1.8	1.2
Investment income of life insurance companies.....	3.5	7.1	16.2	24.4	57.2	50.8	203.0
Total Imputed Income.....	46.6	33.4	42.8	65.1	139.8	116.0	89.3
<i>Personal Income</i>	461.3	659.7	894.2	1,518.7	3,139.4	2,668.1	1,883.6
							533.0
							11,225.0
Adjustments							
Retained earnings.....	7.3	11.3	11.0	11.8	20.0	24.9	148.7
Unshifted portion of corporation income tax.....	7.4	11.5	11.3	12.0	20.3	25.3	235.0
Social insurance contributions borne by workers.....	6.2	15.0	29.1	49.4	50.6	30.0	151.2
Property tax and natural-resource revenues borne by stockholders.....	2.9	4.5	4.4	4.6	8.0	10.0	15.7
Miscellaneous.....	1.6	2.4	2.8	3.6	6.7	7.1	59.6
Total Adjustments.....	25.4	44.7	58.6	81.4	105.6	97.3	94.0
<i>Total Adjusted Personal Income</i>	486.7	704.4	952.8	1,600.1	3,245.0	2,765.4	51.3
Less government interest and transfer payments.....	235.1	138.2	97.4	125.8	221.8	169.0	402.3
<i>Total Pre-Government Income</i>	251.6	566.2	855.4	1,474.3	3,023.2	2,596.4	815.3
Less government revenues.....	157.4	167.5	281.1	477.8	990.5	811.4	2,285.9
Plus government expenditures.....	462.3	370.8	409.8	615.2	1,053.0	733.6	12,040.3
<i>Total Post-Government Income</i>	556.5	769.5	984.1	1,611.7	3,085.7	2,518.6	123.7
							1,111.0
							10,929.3
							3,735.5
							4,235.4
							11,429.2

Primary Sources: National Accounts Division of D.B.S.; Department of National Revenue; Public Finance Division of D.B.S.; and Appendix B.

deducting the foreign share. The balance of \$406 million is multiplied by the proportion of dividends held in Ontario (46 per cent). This is equal to \$183 million and is distributed according to dividends received.

The same procedure is used in computing the amount of the Ontario corporation tax borne by Ontario residents except that it is assumed that a larger proportion of the Canadian-held shares are owned by residents of the province. There are, no doubt, many small corporations that are wholly owned within the province. At the same time, however, the distribution of ownership of large corporations paying tax to the Province is likely to be very little different from the distribution of shares of an average Canadian corporation. Since there is no empirical information on this point, we assume that 50 per cent of the Canadian-held shares of Ontario taxpaying corporations are held by residents of the province. The amount of Ontario corporation tax receipts (\$152 million) borne by Ontario stockholders is equal to \$25 million.

In computing the part of other provincial corporation taxes resting on the residents of Ontario, the same method of computation is used. For this calculation, it is assumed that 42 per cent of the Canadian-held shares of corporations paying tax to other provinces is owned by Ontario residents.¹⁰ The amount of corporation taxes levied by other provinces and borne by Ontario residents equals \$31 million.

The social insurance contributions and government pensions that fall in part on wage earners include unemployment insurance, workmen's compensation and industrial employees' vacation contributions, and public service pensions. It is assumed here and in the next part of the chapter dealing with taxes that the total employee and one-half of the employer contributions rest on wage and salary earners. Thus three-fourths of the contributions for unemployment insurance (\$110 million) and one-half of the workmen's compensation and industrial employees' vacation payments (\$58 million) is borne by the worker. In addition, only one-half of the pension contributions (\$168 million) is borne by wage and salary earners because it is assumed that the government share is not shifted. The totals of each of these three components are \$83 million, \$29 million and \$84 million.

The total of property and other taxes resting on income receivers equals \$145 million. These are chiefly revenues that rest on business firms and include portions of the business tax, natural resource levies and miscellaneous revenues, in addition to the property tax.

The sum of all adjustments to personal income equals \$815 million which when added to the personal income computed earlier, gives a total of \$12,040 million. The pre-government income concept can now easily be computed by subtracting \$1,111 million of transfer and interest payments. This total of \$10,929 million is an estimate of the total income in the absence of government fiscal activity.

Our concept of post-government income utilizes the results of Chapters 3 and 4 which discuss revenues and expenditures. From the pre-government figure of \$10,929 million, we subtract \$3,735 million of taxes and to that add \$4,235 million of government expenditures. The figure of \$11,429 million is then our

estimate of total income received by Ontario residents in 1961. The following table summarizes the derivation of our post-government income concept.

One consequence of using this post-government income concept and all other except family money income should be explained. Owing to the classification of income used in the basic data, our income brackets are in terms of family money income. Thus when we add the non-money components to family money income some families in each given bracket will have more income (money + non-money) than indicated by the upper bracket limit. It is judged, however, that little distortion in the results occurs. This is first because post-government income is less than 8 per cent larger than family money income. Second, even though there is too much income in a given class, there are also too many tax payments and government expenditures allocated to the class. For example, if there is 5 per cent too much income in the class, it is likely that approximately 5 per cent too many tax and expenditure dollars are also allocated to the class.

FOOTNOTES

¹Many definitions of income are described and analysed by W. Irwin Gillespie, "Effect of Public Expenditure on the Distribution of Income", in Richard A. Musgrave, Ed., *Essays in Fiscal Federalism*, pp. 125-32 (Washington: The Brookings Institution, 1965).

²This generalization is not unanimous. See, for example, R. S. Tucker, "Distribution of the Tax Burden in 1948", *National Tax Journal* Vol. IV, No. 3 (September 1951), pp. 269-85 and "Rebuttal", *ibid.*, Vol. V, No. 1, (March 1952) pp. 36-8.

³For our own purposes the treatment of interest is only of theoretical importance. Since we use post-government income as our base, interest payments are included as part of government expenditure.

⁴In algebraic terms, the income concepts can be illustrated as follows:

Let money income components = A
 imputed income components = B
 corporate retained earnings and taxes that are based on income (other than personal income tax) = C
 government interest and transfer payments = D
 total government revenues = E
 total government expenditures = F

Then:

Family Money Income = A
 Personal Income = A + B
 Adjusted Personal Income = A + B + C
 Pre-government Income = A + B + C - D
 Post-government Income = A + B + C - D - E + F

⁵In general the total for each income component is based on material received from the National Accounts Division of Dominion Bureau of Statistics, and the distributive series for each is derived from data supplied by the Central Research staff of D.B.S. A detailed description of the basic data and the techniques used in making our estimates is found in the appendixes.

Some non-money components are also in this measure. For example, wages and salaries include employer contributions to private pension and medical insurance plans.

⁶Capital gains should also logically be added in here but due to the absence of data on both the total and distribution of capital gains in Canada, this adjustment is neglected.

⁷This definition of personal income differs slightly from the national accounts definition of personal income, and so our total differs from the D.B.S. estimate of personal incomes, \$11,484 million. Our measure can be reconciled with D.B.S.'s by adding to our \$11,225 grants to non-commercial institutions and corporate charitable contributions of \$324 million and subtracting \$65 million of pension income.

⁸The proportion of the total book value of Canadian industry owned by foreigners is 34 per cent. Although there is a large variation in the percentage of foreign ownership among various industries, the average percentage has remained stable since 1951. For this and other information on foreign investment see *The Canadian Balance of International Payments, 1961 and 1962 and the International Investment Position*, (Ottawa: Queen's Printer, 1964), Table XII.

The use of investment information to distribute retained earnings between Canadians and foreigners does involve the assumption that retained earnings are proportional to investment. This assumption is correct if foreign and domestic firms are equally profitable and if the pay-out ratios are the same for both categories of firms. Normally the pay-out ratios for foreign-owned firms are less than for Canadian-owned firms. However, in 1961 the pay-out ratio for both groups of firms was just below 60 per cent. D.B.S., *op cit.*, p. 22, and Dept. of National Revenue, *1963 Taxation Statistics* (Ottawa: Queen's Printer, 1963), Section III. Evidence on the question of profitability is not conclusive, but information given in the 1962 Report of the *Corporations and Labour Unions Returns Act* (Ottawa: Queen's Printer, 1965), and in W. Irwin Gillespie, *The Incidence of Taxes and Public Expenditures in the Canadian Economy*, a report to be published by the Royal Commission on Taxation, fn. 36, gives some support to the view that there is no difference in the profitability of foreign- and domestically-owned firms. Thus, we believe that allocating retained earnings to stockholders in proportion to investment does not introduce any significant errors in our estimate of income.

⁹Distributing retained earnings to Ontario families on the basis of dividends received is correct if the ratio of dividends to investment is equal in all provinces and all income classes.

¹⁰The derivation of the percentage is explained in fn. 26 in Chapter 3.

CHAPTER 3

Incidence of Government Revenue Programs

IN THIS chapter we estimate the distribution of tax payments as a percentage of income. This involves several steps. First, we select the government revenues that are included in the study. Next, we present theoretical hypotheses regarding the incidence of broad categories of revenues. Using these hypotheses, we subtract the amounts imputed to non-residents of the province from the total revenues collected. The remaining amounts are then distributed among families by income bracket. The distribution of revenues is based on the incidence assumption adopted for each revenue item and the statistical series that approximates the pattern of revenue burden. Finally, we obtain a schedule of "effective tax rates" by dividing the distribution of tax payments by the distribution of income developed in the previous chapter.

There are several points of view that could be followed in the selection of revenue items. We discuss three of these views here. One point of view is that only compulsory items that are levied for the purpose of raising revenue for general expenditures should be included. This view excludes benefit-based levies such as the gasoline tax, which is used to charge families who directly benefit from the proceeds of the tax through the use of roads. The rationale for this exclusion is that a benefit-based levy is a substitute for an expenditure that families would make if the government services were supplied by the private sector of the economy. Thus, the government is not placing a burden on families by these benefit levies but is only charging for a service that is supplied by it.

A second point of view is that taxes plus items that are substitutes for taxes, such as profits from the sale of liquor, should be included. The chief argument for this view is that taxes are compulsory and are generally designed to raise revenue, and thus are a burden on incomes. Another argument for including all taxes is that it is difficult to determine which taxes are levied to charge families for a specific service and which taxes are used to finance general expenditures.

A third point of view is that all government revenues should be included. The arguments for this point of view reflect the difficulties that are involved in selecting the "correct" revenue items. First, it is difficult to separate benefit-based levies from general levies. For example, the property and corporation income taxes are defended partly on benefit grounds. Second, the burden of items that are commonly accepted as benefit levies may be imperfectly related to the benefits received. It may be, for example, that commercial vehicle owners are paying for a higher proportion of road costs than the proportion of benefits from roads that is accruing to them. Third, many charges do not represent a payment for a service that would otherwise be sold by a private firm. It is unlikely that drivers' licences and road fines would be charged in the absence of government. Fourth, the compulsory nature of taxes cannot be used as a dividing line because some charges

are more difficult to avoid than some taxes. For example, the hospitals tax on food can be avoided by eating in a restaurant that does not feature "live entertainment" but it is impossible to buy a used car without paying the transfer fee.

In our investigation we accept the third point of view. Although the concepts resulting from the first two points of view are appropriate to use in many investigations, particularly those involving only the revenue side of the budget, we judge that the third point of view is the appropriate one to adopt for our purposes. This point of view is chosen partly because of the arguments given above and partly because we are primarily concerned with measuring the impact of both revenue and government expenditures on income. As mentioned previously it is difficult to determine a basis for including some revenues and excluding others. This problem is even greater for expenditures. If all expenditure items and only some revenues were included in the analysis, a distorted view of government's impact on income would result. Similarly, the exclusion of some revenues and expenditures would also affect the results unless the omitted revenues were equal to the omitted expenditures and unless the revenues paid by families in each income class were equal to the expenditures allocated to the class. Therefore we include all government revenues in our analysis. This means that in addition to items classified as taxes we have included liquor licences and profits, motor vehicle licences, social insurance contributions, fees and income from natural resources, fines and penalties, sales and services, and other miscellaneous revenue.

In Chapter 1 we discussed the problem of which government units should be included in the analysis and we concluded that our investigation should encompass the fiscal activity of all governments in Canada. We further concluded that the revenues and expenditures of the Ontario provincial and municipal governments should be reduced by the amounts exported outside the province and that the revenues and expenditures exported by the other provincial and municipal governments to Ontario residents should be included in our investigation. Thus it is necessary to determine the portion of each revenue item that is borne by Ontario residents before the revenue burden in each income class can be computed. In our analysis we have made these computations in steps. We first estimate the revenue burden shifted to foreign families and then determine the portion of the remainder that falls on residents of Ontario.

There are three categories of foreigners bearing some of the burden of Ontario revenue programs:

- (1) Consumers of goods produced in the province,
- (2) Receivers of capital income earned in the province,
- (3) Tourists visiting the province.

Revenues collected by the other provinces and their municipalities can be shifted to Ontario residents in an analogous manner.

Foreign consumers bear a portion of the Canadian taxes that enter the cost of producing Canadian exports. Many of the taxes levied in Canada increase the cost of producing and distributing goods and services and are shifted forward to consumers in the form of higher prices. Examples of taxes that generally fall into this category are the gasoline tax paid by owners of commercial vehicles and

portions of the property and corporation taxes. Whether Canadian firms can shift these taxes forward to foreign consumers depends on conditions in international markets. If Canadian firms exercise the same amount of control on foreign markets as they do on the domestic scene, it is no more difficult to shift taxes to foreign than to domestic consumers. If, on the other hand, Canadian costs, including transportation costs but excluding taxes, are approximately equal to the costs of the competing foreign firm, it is very difficult to shift these taxes to foreign consumers. In this case, the entire burden of these taxes, if shifted forward, would fall on Canadian consumers. Since most of Canada's competitors in world markets face cost and tax structures similar to Canada's, we assume that these taxes are shifted to foreign consumers to the same extent that they are borne by Canadian consumers. We recognize that some industries cannot shift the tax, because of competitive conditions in the foreign market, but for other industries the foreign price may rise by more than the full amount of the tax because of a strong market position and tax pyramiding. Thus, 18 per cent of these taxes is assumed to accrue to non-residents of Canada. The figure of 18 per cent is equal to the ratio of the value of exported goods to the value of gross domestic product.¹ After subtracting the foreign share of the taxes, the proportions of the taxes levied by the various Canadian governments that are assumed to rest on Ontario residents are as follows:

- (1) Ontario provincial and municipal taxes —50 per cent
- (2) Federal taxes —37 per cent
- (3) Other provincial and municipal taxes —31 per cent²

A second group of non-residents who bear a portion of Canadian taxes are those who receive a return on capital invested in Canada. Taxes assumed to fall on recipients of profits are the unshifted parts of the property and corporation income taxes. It is assumed here that foreign owners share the burden of these taxes in proportion to their ownership of Canadian companies. As explained in the previous chapter, the ratio of foreign investment to total investment in Canada is approximately 34 per cent. Thus 34 per cent of taxes borne by profit recipients is deemed to accrue to non-residents of Canada.³ After subtracting this proportion, the computed percentages of the burden resting on Ontario residents are:

- (1) Ontario provincial and municipal taxes —50 per cent
- (2) Federal taxes —46 per cent
- (3) Other provincial and municipal taxes —42 per cent⁴

The third group of non-residents who pay some of the Canadian taxes are tourists. While in Canada, they bear some of the tax burden through their purchases. In percentage terms, they pay a substantial proportion of the gasoline tax (10 per cent), amusements (25 per cent), and liquor taxes (10 per cent). They also pay some of the general sales and other excise taxes but most of these payments are neglected in our analysis.⁵ The proportion of Ontario taxes paid by tourists from other provinces is equal to one-fifth of the foreign share.⁶

The following table indicates the total tax for both the federal and Ontario governments, and also shows the amount of federal, Ontario, and other provincial and municipal taxes borne by Ontario residents.

TABLE 3:1—Government Revenues by Source, 1961

Revenue item	Ontario provincial and municipal		Federal		Other provincial and municipal—	Total Ontario Payments
	Total	Ontario share*	Total	Ontario share*	Ontario share*	
(millions of dollars)						
Personal income tax.....	120.7	120.7	1,850.0	847.4	—	968.1
Corporation income tax.....	151.8†	56.2	1,232.0	373.3	56.9	486.4
General sales tax.....	141.2‡	127.9	1,045.0	352.0	—	479.9
Highway-user revenues.....	247.1	146.8	—	—	48.6	195.4
Selective excise taxes.....	94.7§	83.0	623.0¶	181.4	—	264.4
Succession duties.....	40.4	39.0	71.0	34.5	—	73.5
Import duties.....	—	—	535.0	180.1	—	180.1
Property tax.....	644.8**	456.1	—	—	90.1	546.2
Natural-resource revenue.....	43.1	17.0	—	—	65.6	82.6
Social insurance contributions..	89.0	72.0	394.0	163.0	—	235.0
Other taxes and misc. revenue..	186.5††	164.7	107.8	38.1	21.1	223.9
Total.....	1,759.3	1,283.4	5,857.8	2,169.8	282.3	3,735.5

Sources: Dominion Bureau of Statistics, *Financial Statistics of the Government of Canada, 1961*; *Financial Statistics of Provincial Governments, 1961*; *Financial Statistics of Municipal Governments, 1961*. Municipal data refer to calendar year, federal and provincial data to nearest fiscal year.

*The amount paid by non-residents of Ontario is estimated utilizing the assumptions made regarding the shifting of taxes to non-residents.

†Includes small amount of tax, collected under The Corporations Tax Act, that is not based on income.

‡The figure shown represents an estimate of the yield of this tax for 12 months. Since it was actually in effect for only 7 months of the year the annual revenue is obtained by multiplying the actual yield by 12/7.

§Includes amusement taxes and revenue from liquor sales and licences.

¶Includes excises on liquor, tobacco, automobiles, and other commodities.

**Includes the business levy as well as the property tax.

††The largest item is hospital premiums (\$89.5 millions). Includes licences (other than liquor and motor vehicle), fines, tax on premium income of insurance companies, sales and services.

As can be seen from the total Ontario payments column, the largest burden results from the personal income tax. The combined personal and corporate taxes paid are over 39 per cent of the total payments. The consumption taxes, which include the general sales tax, highway-user revenues, selective excises, and import duties make up 30 per cent of the total. The property tax adds 15 per cent, and the remaining 16 per cent consists of succession duties, natural-resource revenue, social insurance contributions, and miscellaneous revenue. For the Ontario provincial and municipal revenues that are borne by residents of the province, the income taxes represent 14 per cent of the burden, the consumption taxes 28 per cent, the property tax 35 per cent and other revenues 23 per cent.

ALLOCATION OF GOVERNMENT REVENUES

Now that we have selected the revenue items included in this investigation, the next step toward obtaining the distribution of revenue burdens among income classes can be taken. This involves examining the incidence of each revenue. For each revenue we first state the incidence assumption that is employed in this study.

We then discuss various assumptions that could possibly be used in a study of this nature. In the course of this discussion we explain the rationale behind our choice of a particular incidence assumption.

Income Taxes

In this section of the chapter we discuss the revenues that are levied on income. Although there are other revenues that are based on income, such as the logging tax, we take up only the personal and corporate income taxes here. As mentioned previously these two taxes account for nearly 40 per cent of the aggregate revenue obtained by governments in Canada.

Personal income tax

The burden of the personal income tax is assumed to be borne by the individuals who make the tax payments to the government, and thus the tax is not shifted. This means that the burden of each provincial income tax is borne entirely by the residents of the province and that the federal income tax burden is distributed by provinces in proportion to the total tax payments of the families in the province.⁷

Although most authorities agree that virtually none of the personal income tax is shifted, there are arguments that can be made against this point of view. These arguments are generally based on the belief that an income tax reduces work effort and/or the supply of capital funds.

It is argued that an income tax reduces the desire to work. As a consequence, firms must offer higher wages in order to secure the same amount of labour that was obtained before the tax. This increase in wages causes costs to rise, and thus firms will charge higher prices to consumers. However, the effect of the income tax on work effort and, consequently, the amount of labour supplied is not clear. On the one hand, an introduction of an income tax (or increase in rates of an existing tax) would tend to cause individuals to work more because their take-home pay would fall, and they would need to work more hours to enjoy the same level of consumption that they enjoyed before the tax. On the other hand, a tax would encourage individuals to work less because the financial return from working would fall. The tax would essentially make it cheaper to take time off from work. The relative pressures of these two conflicting tendencies depend on the progressivity of the tax, the preferences of the workers involved, and the magnitude of the tax change. An income tax that affects all types of workers may cause total work effort to increase, decrease, or remain the same. Thus, it is far from certain that an income tax would cause individuals to change the amount they desire to work.

Another argument in favour of assuming that work effort does not change is that most workers do not have the opportunity to vary their work. In general, it is only the self-employed and executives who can determine the amount that they will work. Empirical studies that have involved studying the effect of the tax on solicitors, accountants, doctors, and executives also support the conclusion that work effort is not altered by an income tax.⁸

There are some cases, however, when an income tax will alter a firm's costs, and consequently, consumer prices. This may occur, for example, where a labour union attempts to regain any loss of take-home pay caused by a tax or when high salaried personnel are transferred from one area to another and income tax rates differ in the two areas. There are also persons who have likely chosen one occupation over another for tax reasons, thus reducing the supply of labour and raising prices in high income occupations that require long periods of education and training. We take the position, however, that these situations are comparatively few and quantitatively unimportant.

The argument that the supply of capital funds is reduced by an income tax is two-pronged. First, the tax usually reduces the income of high income recipients more than alternative levies. Since a large percentage of capital funds comes from these high income receivers, the tax reduces the capacity for supplying funds. Second, the tax may reduce the incentive to supply capital. For example, assume a potential investor is indifferent between providing risk capital at a 10 per cent return or holding his money and enjoying a high degree of liquidity. If then an income tax is put into effect, and this individual is to be taxed at a 50 per cent marginal rate, his alternatives become a net return of 5 per cent on a risky investment as opposed to enjoying the same liquidity as before. Thus, it is argued that he will now prefer to remain liquid and the supply of capital would be reduced. The reduced supply of capital would then cause interest rates to rise, thereby raising costs and prices.

Although the argument that the income tax reduces the supply of capital has some validity, the impact of the tax on capital may not be very great. First, the supply of capital is dependent to a large extent on the monetary policy of the central bank. Any tendency on the part of the private sector to reduce the supply of capital funds may be counteracted by the Bank of Canada. In addition, an income tax may cause some potential investors to supply more capital funds in an effort to maintain the amount of net interest and dividends received before the tax.

Therefore, even though the personal income tax is sometimes shifted forward to consumers, we believe this to be the exception rather than the rule, and thus are quite confident of our assumption that the tax is not shifted.

Corporation profits tax

It is assumed that one-half of the burden of the tax falls on profits, and one-half is shifted forward to consumers in the form of higher prices. As indicated previously, much of the unshifted portion of the federal and provincial corporation income taxes (34 per cent) rests on foreign stockholders. The remainder of the burden is assumed to be borne by Canadian stockholders in proportion to dividends received. After deducting the foreign share of the unshifted portion of the tax, it is estimated that Ontario residents bear 50 per cent of the Ontario tax, 46 per cent of the federal tax and 42 per cent of the corporation taxes levied by the other provinces. We assume that consumers pay the shifted part of the tax in proportion to their purchases of goods and services. After deducting the share

paid by foreign consumers, Canadian residents pay 50 per cent of the Ontario tax, 37 per cent of the federal tax, and 32 per cent of the corporation taxes levied by other provinces.

The incidence of the corporation income tax is a very cloudy area indeed. There are various assumptions that can be supported by both theoretical and empirical studies, but there is no consensus on the incidence of the tax.⁹ The traditional point of view is that none of the tax is shifted. This is based on the assumption that a firm is maximizing profits before the tax. When a profits tax is introduced, profit net of tax falls but the firm continues to produce the same output and sells the commodity at the same price. This is because profit net of tax will be highest where pre-tax profits are maximized.

The above analysis has been criticized on several grounds. First, it is argued that in many industries firms charge a price that is lower than the profit-maximizing price. This is because many firms merely aim at making satisfactory profits. This behaviour is caused by a fear that a profit-maximizing price would encourage other firms to enter the industry and/or the government to take action to make the industry more competitive. It is further argued that the introduction of a corporation tax would cause the firms to raise prices in order to reach a satisfactory level of profits. Firms would have no hesitation about moving to this new price position because the profits net of tax would not be exorbitant and the above fear would be reduced or eliminated. Second, it is also argued that many firms practise "mark-up" pricing. Firms using this pricing technique simply add a fixed percentage to their unit costs when setting the price for their product. It is further hypothesized that the introduction of a corporation tax causes firms to increase this fixed percentage. In all of these cases at least a portion of the corporation income tax is shifted forward to consumers. The shifting is far from uniform, even for firms in the same industry, because the income tax per unit of goods sold differs among firms. However, it does seem reasonable to assume that some of the tax is shifted forward in the form of higher prices, even in the period shortly after the tax has been introduced.

Other proponents of the forward-shifting view argue that even though very little of the tax is shifted in the period immediately following the introduction of the tax, much of it is shifted in a later period. The tax at first reduces the return on capital. This decreases the amount of capital funds flowing into the corporate sector, thereby reducing the rate of expansion, and consequently causing higher prices. The amount of shifting is difficult to ascertain, however, because demand and cost conditions as well as the degree of foreign competition are constantly changing.

Our investigation is concerned with all corporate activity. Therefore, we include a heterogeneous group of firms. They practise a wide range of pricing policies, and operate under vastly different market conditions. Thus we adopt a compromise position and assume that one-half of the tax is shifted forward to consumers, and one-half is borne by corporate profit recipients. However, since there is such a wide range of opinion about the incidence of the corporation tax, we calculate the burden of the tax under different assumptions in Table 3:4.

Commodity Taxes

This category includes the excise and general sales taxes levied by the provincial and federal governments. Since we make the same basic assumption regarding the burden of all these taxes, it is useful to discuss the incidence of a commodity tax generally, before specifically examining each tax.

The provincial taxes are collected by firms but are technically levied on consumers, and the federal taxes are levied primarily on manufacturing firms. The identification of the initial payer of the tax, however, is of little aid in determining the incidence of the tax. This is because firms may lower their price (net of tax) below the pre-tax level in response to provincial taxes, and thus, some of the tax burden will be borne by the owners and/or workers. Manufacturers may pass some of the federal tax on to consumers through charging higher prices. In fact, the incidence of a commodity tax depends on many factors, including the breadth of coverage of the tax, the supply and demand conditions in the market for the taxed items and in the market for labour and other resources used for producing the taxed items, the length of the adjustment period analysed and the monetary and fiscal policies pursued by the federal government.¹⁰

The traditional assumption regarding the incidence of commodity taxes is that taxes are borne by consumers in the form of higher prices. This assumption is implicit in much of the commodity tax legislation. For example, the rationale for the exemption of some commodities from both the federal and the provincial general sales taxes is based on the belief that the tax is borne by the consumers. Although this assumption is generally supported by experts in the field, there are also some who support the hypothesis that families bear the taxes in proportion to their income. We have adopted the traditional point of view and have assumed in our computations that all the commodity taxes are borne by families in proportion to their expenditures on taxed items. However, since the incidence of commodity taxes is subject to some controversy¹¹ we briefly describe the analysis underlying both points of view and the basis for our conclusion in the following paragraphs. To simplify this discussion, we divide commodity taxes into two categories: excise and general sales.

Excise tax

As mentioned above, the impact of a commodity tax depends on many factors. Two of the factors that are particularly important in the analysis of an excise tax are: the supply and demand conditions in the product and resource markets, and the length of adjustment period. When an excise tax is placed on a commodity where competition among the firms producing it deprives any one firm of any control over its price, the immediate effect is that the price paid by purchasers increases by a small amount and the after-tax price received by the firms falls by nearly the full amount of the tax.¹² When a sufficient time has elapsed for firms to vary the amount of resources they can employ, they will reduce their output in order to reach a profit-maximizing (loss-minimizing) position. This reduction in output will cause the price to rise, but the price net of tax is not likely to reach the pre-tax level. In this short-run situation the owners of the firm, and possibly

resource owners as well as purchasers, absorb some of the burden of the tax. The impact of the tax on industries producing non-taxable commodities is not certain, but both prices and profits are likely to increase if the tax proceeds are spent and/or there is a shift toward buying non-taxable goods because of the increase in the price of the taxed commodity. In a longer period where firms are able to enter or leave an industry, firms will tend to leave the taxed industry and enter the non-taxed industries where profits are likely to be higher. This reduction in the output of the taxed product will cause prices to rise further. Movement from the taxed industry to other industries will continue until no firm can improve its profit position by leaving the taxed industry. In this situation, depending on cost conditions in the taxed industry, the price to purchasers may have risen by an amount that is greater than, equal to, or less than the amount of the tax.

In industries where firms exercise some control over the market price of commodities, the response to a tax change takes place more quickly, and purchasers may in the short run bear a substantial portion of the tax through paying higher prices. If the industry consists of only one firm, it is likely that both purchasers and firm owners share the tax burden in the short run. The firm owners will, of course, attempt to shift some of the burden backwards to owners of productive resources. Even in the long run the tax may be shared if the firm is earning more than normal profits before the introduction of a tax. If the industry is characterized by having a small number of firms, the impact of a tax on price is difficult to predict. A firm in this type of market will generally take account of the probable response of competitors when it changes its price. Since a tax affects all firms, each firm may assume that its competitors will raise their prices and consequently prices may rise by the full amount of the tax. If firms price their products by placing a percentage "mark-up" on per-unit cost, the price will rise by more than the tax. Thus, even in the short run the prices in many industries consisting of a few firms may rise by the full amount of tax. In the long run this effect will become pronounced because firms that are unable to obtain average profits will leave the taxed industry.

In industries where there are firms that are attempting to achieve goals other than short-run profit maximization, prices may initially increase very little, and firm owners will bear most of the tax. For example, an individual firm may attempt to get a larger share of the market by absorbing the tax, on the assumption that prices of products sold by other firms will rise. If this strategy is practised by a substantial number of firms it may be difficult for any firm in the industry to raise its price. However, over the long run there are likely to be some firms moving out of the taxed industry and the price will likely drift upwards until it has risen by the full amount of the tax.

The impact of an excise tax on the price of a product will differ from industry to industry. In some cases the tax may be largely borne by the owners of a firm or by the owner of a resource employed by the firm. In other situations, prices may rise by more than the tax. However, our analysis leads us to conclude that the best single assumption that can be made is that prices ultimately rise by the amount of the tax. Thus, we adopt the assumption that excise taxes are borne by families in proportion to their expenditures on taxed items.

General sales tax

When a sales tax encompasses nearly all items rather than just one commodity, the magnitude of the price and resource movements described previously is small. If a general tax is introduced, the retail prices of all commodities tend to move upward together, since the tax represents the same percentage increase applied to the price of each good. Although the response of consumers to a price rise is not the same for every commodity, so that there is a tendency for individuals to allocate their expenditures differently than before the tax, the changes are not as large as in the case where the tax is only placed on a few goods. The only part of income that escapes the tax is savings, and consumption and savings may not be close substitutes. In addition, because all commodities are taxed, there is less impetus for firms to move out of one industry into another. In such circumstances, the general opinion is that a broadly-based sales tax is borne by consumers in the form of higher prices, but there is nevertheless a view that the tax is shifted backwards to the suppliers of labour and other resources in the form of lower wages and other cost payments by firms. The proponents of this backward-shifting assumption develop their case by analysing the tax alone, without considering how government spends the proceeds of the tax. They argue that some of the purchasing power of consumers will be siphoned off by the government, with the result that either prices must fall, if the current level of output is to continue to be sold, or prices will remain high, in which case unemployment will result. In either case, it is argued that the burden will be borne through lower incomes rather than through consumption.

This line of analysis completely ignores the possibility that the government will increase its expenditures as a result of the revenue received from the sales tax. It is recognized that the government may allocate its expenditures differently from consumers, and thus affect the relative profitability of various industries. However, if some of the sales tax receipts flow to the government because the public reduces its savings, the combined effect of the sales tax-government expenditures will be expansionary.

It is by no means inevitable that, when a government levies a general sales tax and thereby siphons private funds to its own coffers, total revenues accruing to producers from the sale of the economy's current output need decline. It is not only that the government will promptly spend much of the tax revenue it receives and that consumers may maintain spending by drawing on savings. The federal government may pursue a policy that adds to the country's total supply of money, thereby encouraging greater spending. This will obviously be desirable if unemployment threatens, because of an inadequate demand for current production. In short, monetary policy will influence greatly the general price and employment effects of sales taxes and hence the direction of shifting that may occur. Contrary to the view that some part of a general sales tax is necessarily shifted backward through declines in the general price level (including the price of labour and other forms of income), we think it entirely possible for the general price level to rise with the introduction of (or increase in) the sales tax. Even if such a rise does not occur, the conclusion of backward shifting does not necessarily follow. If, for

example, the general price level remained stable, through increases in the prices of taxed items and decreases in others, the burden of the tax would then be distributed according to the purchase of taxed items rather than according to income.

In a dynamic situation where changes in consumer preferences, technological advances and increases in income and prices are continuous, it is difficult to determine by actual market study the incidence of a sales tax. However, on the basis of all our theoretical analysis, we support the argument that the sales tax is borne by consumers. Therefore, although we recognize that the retail price of every taxed commodity does not rise by the exact amount of the tax whenever the sales tax is introduced or increased, we believe that this is the best single assumption that can be made. However, because there is a body of economists who support the hypothesis that commodity taxes are shifted backwards to resource owners, we calculate, for the purpose of comparison, the burden of the Ontario sales tax on the assumption that the tax rests on families in proportion to the revenue they receive. (See Table 3:4.)

Incidence of Canadian Commodity Taxes

Now that we have examined the theoretical arguments relating to the incidence of commodity taxes, we can discuss each of the Canadian taxes that fit into this category. In discussing each of these revenues we do not repeat the arguments given in the previous pages but only present the particular characteristics of the tax that tend to reinforce or contradict the general conclusions determined above.

General sales tax

There are two forms of the general sales tax that affect Ontario residents. One is the federal tax on manufacturers and the other is the retail tax levied by eight provincial governments. As described previously, it is assumed for our analysis that the entire burden of both forms of the tax is borne by consumers. Since the tax is not placed on commodities delivered outside the country, the proportion borne by non-residents of Canada is much smaller than the forward-shifted part of the corporation tax. Foreigners do, however, pay a portion of the tax in the following manner. Although most producer goods are exempt from the levy, firms do pay some of the tax through their purchases of non-exempt items. It is estimated that 37 per cent of the federal tax proceeds and 17 per cent of the provincial sales tax revenue are obtained from taxing producers' goods.¹³ The tax is then part of the cost of doing business and we assume that this cost is shifted forward to both domestic and foreign consumers in the form of higher prices. After deducting the foreign portion of the taxes, Ontario residents bear approximately 34 per cent of the federal tax, 91 per cent of the Ontario sales tax, and 4 per cent of the taxes levied by the other provinces.

Neither the federal nor the provincial taxes are completely general since they do not cover all expenditures. In addition to the exemption given producer goods, services are excluded and certain consumer expenditures are exempt from the taxes. Both forms of the tax exempt food and the retail tax exempts children's clothing, most medicines, and small expenditures. In distributing the burden of the Ontario

sales tax among families, it is assumed that approximately 100 per cent of the expenditure on furnishings and equipment, 80 per cent on clothing, 55 per cent on automobiles, 20 per cent on other transportation, 75 per cent on recreation, 95 per cent on smoking and alcoholic beverages, and 65 per cent of household operation expenditures are taxed. The coverage of the federal sales tax is similar to the Ontario coverage but is not precisely the same because of some differences in exemptions and because they are levied at different levels of production.

Road-user revenues

This category includes only provincial revenues. The major component is the gasoline tax, but taxes on other fuels burned by road-using vehicles and all motor vehicle registration fees are also included. Although each of these revenue components is assumed to be borne by consumers, the pattern of incidence differs, depending on the initial payer of the tax or fee.

For our analysis, these revenues are classified into two groups: those paid by passenger vehicle owners and those paid by commercial vehicle owners. The amount paid by passenger vehicle owners is further subdivided into gasoline taxes and registration fees. The taxes and fees paid by commercial vehicle owners are a cost of producing a good or service in much the same way as wages, or the sales tax which falls on producer goods. Thus, the burden is assumed to be shifted forward to both resident and non-resident consumers alike, with the Ontario share of the provincial tax totalling approximately 37 per cent. The Ontario fuel taxes paid by owners of passenger vehicles are assumed to rest on the purchasers of gasoline, and we estimate that 20 per cent of this accrues to non-residents of the province.¹⁴ The registration fees paid by passenger vehicle owners fall entirely on Ontario residents in proportion to their expenditures on car purchases. Thus, since we estimate that one-half of both registration fees and fuel taxes are paid by commercial vehicle owners,¹⁵ Ontario residents bear approximately 60 per cent of the road-user taxes and fees levied by Ontario and approximately 18 per cent of those levied by the other provinces.

Although the previous general discussion of the incidence of a commodity tax is applicable to road-user levies, there are relationships that exist here which give additional support to our assumption that the tax rests entirely on consumers. In particular, there is widespread agreement on the assumption that the taxes and fees paid by passenger vehicle owners are not shifted. This is because both the type of automobile purchase and the use of it are little affected by changes in the price of gasoline. One reason for this is that small changes in the price of gasoline cause even smaller percentage changes in the cost of operating an automobile. Thus, since the amount of gasoline used by families is little affected by small changes in its price, sellers are not forced to lower their price, net of taxes, when the tax rate rises. Consequently, the price rises the full amount of the tax. Registration fees are set by the government and it seems unlikely that these can be shifted by passenger vehicle owners. This is because small changes in these rates likely would not affect automobile ownership to any great extent. Even if the rate changes would affect the number of automobiles sold, the pricing policy

in the automobile industry is such that it is unlikely that automobile prices would fall in response to the fall in demand.

Similar to any other tax that affects the cost of production, there is disagreement as to the incidence of the taxes and fees paid by commercial vehicle owners. The demand for commercial transportation services is dependent on the demand for the final good that is transported. Since this includes some commodities that can be transported by other modes of transportation, it is difficult for the suppliers of road transportation services to shift cost increases forward. This is because increases in trucking prices would cause firms to transport more of their goods by alternative methods of transportation and cause consumers to substitute goods and services that have a low transportation content for those with a high content. Therefore, some would argue that at least part of the tax is borne by the owners and workers in the trucking industry through lower wages and profits. Our own view is that given a longer period of time, marginal firms and workers would leave the trucking industry, thereby reducing the supply of services supplied by commercial vehicles. This would cause the price of trucking services to rise by the full amount of the tax so that wages and profits in the industry would be in the same relationship with other industries as existed before the tax increase. Although this same argument may hold for many commodity taxes, we believe that it is particularly applicable to the road-user levies because almost all of the resources used in the trucking industry are easily adaptable and/or have fairly short lives. For example, truck drivers can be trained in a much shorter time than individuals in other trades, and trucks have a shorter working life than most equipment used in manufacturing or railroad industries.

Therefore, our assumptions that the road-user levies paid by passenger vehicle owners are not shifted, and that the taxes and fees paid by commercial vehicle owners are shifted to consumers according to their consumption expenditures can be supported on theoretical grounds. The empirical evidence on this point is not conclusive and the amount of shifting no doubt differs from one product to another. However, taking all commodities transported by road-using commercial vehicles into account, any error caused by accepting our assumptions would likely be small.

Selective excise revenues

At the provincial level, this category includes the hospitals tax, race tracks tax, liquor profits and liquor licences. Although liquor profits and liquor licences are not taxes in the usual sense of the word, they are concerned with a specific product and thus are placed in the selective excise category. The profit item includes both taxes on beer and wine and the profit from the government liquor stores. This profit can be viewed as a tax since it is an alternative to taxing liquor directly and allowing it to be sold by a private liquor store. This method of taxing liquor is used in several states and other provinces. The licences can also be treated as an excise tax on liquor. This is because the amount of liquor demanded is not very responsive to price changes and the amount paid for a licence is likely shifted forward to consumers of liquor in the form of higher prices. Thus, the burden resulting from the charge for a liquor licence is borne in much the same way as

an excise tax on liquor. The federal portion includes excise taxes on liquor, tobacco, automobiles,¹⁶ and other miscellaneous commodities. Again, it is assumed that these taxes are borne by consumers in proportion to their purchases of taxed items.

Non-residents visiting Ontario bear some of the provincial levies in this category. On the basis of our calculations and information provided by the Ontario Department of Travel Research, we assume that 10 per cent of the liquor levy and 30 per cent of the hospital and race tracks taxes are borne by non-residents. The reason for the high proportion of these taxes borne by non-residents is that they devote a much larger percentage of their total expenditure in Ontario to liquor, admissions, and pari-mutuel betting than does an average Ontario resident.

Ontario residents pay the federal excise levies on liquor, tobacco, and the many miscellaneous items subject to tax in proportion to their purchases of these items. Part of the excise tax on automobiles is paid in proportion to the expenditure on passenger vehicles and the other part of the tax originally paid by owners of commercial vehicles is distributed in proportion to consumption expenditures. Combining all of these federal excise taxes, we estimate that approximately 30 per cent of the total is borne by Ontario residents.

Import duties

We assume that all of the import duties are shifted forward to consumers in the form of higher prices. In allocating the portion of the tax that is borne by non-residents of Canada, an arbitrary assumption is employed. Previously, when analysing the forward-shifted portion of the corporation income tax and the excise and sales taxes that enter the costs of production, we have assumed that 18 per cent of the tax is borne by non-residents. The percentage of import duties borne by non-residents is likely less than 18 per cent, however, partly because the proportion of imported goods later exported is likely to be less than the ratio of exports to total production. First, some goods on which duty is paid are imported directly by families, not firms, and thus the tax does not enter the cost of production. Second, many of the commodities imported by firms are consumer rather than producer goods and it is unlikely that these commodities are exported. We also believe that the 18 per cent figure is too high because many items imported and then exported, are free of the import duty. Thus, with the above arguments in mind, we have given the Canadian imports a cursory examination and concluded that approximately 9 per cent of import duties are exported to non-residents of Canada. Although this 9 per cent figure may not be precisely correct, it is likely to be superior to using either zero or 18 per cent which are the principal alternatives. As in the case for general taxes borne by consumers, we assume that the Ontario residents pay approximately 37 per cent of the Canadian total.

Taxes on Assets

Wealth or assets along with income and expenditure form the base of nearly all government revenues. However, taxes on assets, in spite of their power to reduce income and wealth inequalities, are not used to any great extent in Canada.

For purposes of analysis we have included death taxes, property taxes and business taxes in this category. Although all of these taxes are based, at least partially, on assets, they have few common characteristics. Death taxes are based on total assets and are an attempt to equalize incomes and wealth. Property and business taxes are only levied on one asset—property—and are levied primarily to raise revenue for municipal governments. As a consequence of these differences, the incidence of death taxes and that of property taxes are not the same.

Death taxes

This category includes both the Ontario and the federal taxes. Owing to the lack of statistical information in the area of death taxes, we have made some arbitrary assumptions about the burden of these levies. We have assumed that all of the federal estate tax is borne by Canadians. We have also assumed that 97 per cent of the Ontario tax is borne by residents of the province and that none of the succession duties levied by the other provinces falls on families residing in Ontario.¹⁷ In terms of the tax burden among income classes we have assumed that the entire burden of the taxes is borne by the families in the \$10,000 and over income bracket. Although we realize that some of these assumptions are not entirely correct, the errors resulting from applying them will have a negligible effect on the total burden of taxation because the total revenue raised from the estate tax and succession duty is small. Nevertheless, the direction of the possible errors is discussed in the following paragraphs.

The use of the first set of assumptions may result in an overstatement or an understatement of the total share paid by Ontario residents. On the one hand, the assumption that none of the federal tax is borne by foreigners results in an overstatement of taxes borne by residents in all provinces, including Ontario. On the other hand, the assumption that some of the Ontario tax is borne by non-residents of the province combined with the assumption that none of the taxes levied by other provinces is borne by Ontario residents results in an understatement of the tax burden on families in Ontario.

Allocating the entire burden of succession duties to the highest income class no doubt overstates the burden borne by this class and understates the amount borne by families in other classes. The degree of error caused by this assumption depends to some extent on who bears the burden of the tax. For several reasons, it can be concluded that the degree of error is likely to be less if the burden is borne by the deceased rather than the beneficiary. First, there is a minimum amount in each estate that is exempt from taxation. Since this exemption often totals at least \$60,000, there is some reason for believing that these individuals are in the highest income class. Second, the proceeds of the estate tax are often distributed among several individuals. If the beneficiaries bear the tax, a larger proportion of the tax revenue is paid by families in the lower income brackets. Third, the deceased usually is older than the beneficiaries and since income is directly related to age, the more the burden falls on the deceased, the more likely it is that the burden is borne by those in the highest income class.

Property tax

Ontario municipalities receive over 70 per cent of their tax revenue from property tax receipts. Since property tax receipts are such a large proportion of total municipal revenue, the pattern of the property tax burden strongly influences the over-all burden distribution of municipal taxation. The burden of the property tax is very complex in that the tax is levied on both land and improvements and on several types of property. In addition, the burden of the tax differs with each type of property. We attempt to estimate the burden of the property tax in two steps. First, on the basis of assessment data,¹⁸ we estimate the tax proceeds from each of the six property sub-groups: business land, business improvements, farm land, farm improvements, residential land, and residential improvements. In addition, we have used information derived from other studies to further subdivide the two residential categories into owner-occupied and rental classes.¹⁹

In constructing the following table, we made two assumptions. One, in allocating the 1961 property tax proceeds among businesses, farms, and residences, we assume that the mill rate is 10 per cent higher on business property than on farm and residential properties. This is because of the Residential and Farm School Tax Assistance Grants and the Municipal Unconditional Grants that provide relief to the residential and farm property taxpayers. Two, in separating the residential portion into owner-occupied and rental categories, we assume that a renter and a home-owner with the same income spend an equal amount on housing. It should be noted that this latter assumption results in allocating an insufficient proportion of the tax to high income classes if renters actually spend less on housing than home-owners with the same income and if renters are concentrated in low income classes.

TABLE 3:2—Percentage Distribution of Property Tax Proceeds by Source of Revenue

	Land	Improvements	Total
Owner-occupied housing.....	8.5%	30.0%	38.5%
Rental.....	3.5	13.0	16.5
Business.....	10.0	26.0	36.0
Farm.....	4.5	4.5	9.0
	26.5%	73.5%	100.0%

Source: Based on data supplied by the Ontario Department of Municipal Affairs.

Now that we have computed the proportion of property tax revenue obtained from each category of property, the second step is to examine the burden of the tax in each. The basic conclusions of tax incidence are as follows:

1. Business land—owners of businesses
2. Business improvements—consumers of all goods
3. Farm land—owners of farms
4. Farm improvements—consumers of food
5. Residential land, tenant-occupied—owners of property
6. Residential improvements, tenant-occupied—renters of property
7. Residential land, owner-occupied—owners of property
8. Residential improvements, owner-occupied—owners of property

As can be seen from the above list, it is assumed that the portion of the property tax levied on land is not shifted, and except for owner-occupied residential housing, the improvements portion is entirely shifted.²⁰ It is recognized that this sharp distinction between the treatment given the tax on land and the tax on improvements does not likely exist for each business, farm or apartment, but in the absence of any empirical evidence to the contrary, we judge that it is the best assumption that can be made. First, although most business, farm and apartment owners do not distinguish between the tax on land and the tax on improvements, but rather examine supply and demand conditions in attempting to shift any increase in the property tax, it is likely that most owners can only shift a portion of the tax. Second, there is some theoretical support for treating improvements and land differently. The amount of land is fixed, but the amount of improvements is not. Thus, if the tax on land increases, it is unlikely that the tax can be shifted to the user of land, unless he is completely unresponsive to price changes. This means that the owner receives a lower rate of return on this investment, and when he wishes to sell his land, he must sell it at a lower price than before the tax increase. This decrease in the price of land results because the rate of return on land has fallen and the return on alternative investments has likely remained constant. In the case of improvements, however, the owner may allow the building (or other form of improvement) to depreciate when his rate of return falls owing to the increase in property tax. Consequently, the supply of improvements will fall and the price will rise so that the after-tax return on improvements will be the same as on alternative investment opportunities in the economy.

In distributing the property tax burden according to the list of conclusions given above, two assumptions should be made explicit. First, in all cases, it is assumed that the ratio of tax to value is equal for all items in each category. The assumption is particularly important for the categories of residential property since expensive property is associated with high incomes. If the ratio of tax to value falls as value increases, we have overstated the burden on high income receivers and understated it on low income families. Two, it is assumed that families bear the tax on farm improvements according to their purchase of food rather than according to total purchases because most farm output is directly or indirectly associated with food. This may overstate the burden on low income families because of the large proportion of their income that is devoted to food expenditures.

The proportion of the Ontario municipal property tax borne by non-residents of the province is equal to 25 per cent and families residing in Ontario bear approximately 10 per cent of the property and business taxes levied by the other provincial and municipal governments. Non-residents bear some of the Ontario municipal property tax as owners of businesses located in Ontario and as consumers of goods produced in the province.

Business tax

The business tax is a municipal levy based on the assessed value of the property of a firm. However, the rate of tax varies by the type of business carried on by the firm: from 150 per cent of the property tax for liquor manufacturers to zero for farmers.²¹ We do recognize that the business tax is different from the

property tax in that the rate varies by the type of business. It is not clear, however, whether this makes the business tax easier or more difficult to shift than the property tax. Thus, in the absence of any empirical information we treat the business tax in exactly the same manner as the property tax. This means that the tax is divided between land and improvements in the same proportions as the property tax and it is assumed that the tax on land is borne by owners and the tax on improvements is borne by consumers. Consequently, approximately 61 per cent of the tax falls on non-residents of the province. The business tax levied by municipalities in other provinces is taken account of in the previous section on the property tax.

Other Taxes and Revenues

The remaining taxes and revenues encompass many small revenues and they do not fit completely into the income, commodity or asset categories discussed thus far. The major components in the other taxes and revenues are natural-resource revenues and social insurance revenues.

Natural-resource revenues

This category of revenues includes several taxes, licences and fees. The major revenue components include the mining tax, logging tax, stumpage fees, and hunting and fishing licences. In allocating the burden of these revenue-raising programs, we classify each source of revenue into one of three categories. One category encompasses items, such as the logging and mining taxes, that are assumed to be similar to a tax on profits. A second category includes items, such as stumpage fees, that are assumed to enter the cost of production in the same manner as a manufacturer's excise tax. The third group includes items, such as camping fees and hunting and fishing licences, that are assumed to be borne by sportsmen. This classification results in allocating 46 per cent of the natural-resource revenue to the first class, 42 per cent to the second, and 12 per cent to the last class. However, it should be noted that there are several items, such as the mining tax, that could be placed in either the first or the second class. For these, we attempt to determine whether the item is in effect a profits or an excise tax and then classify it in the most appropriate category.

We assume that families bear the burden of the items in the first class in proportion to their burden of the corporation income tax, the items in the second class according to their expenditure on all goods and services, and the third group of items in proportion to their expenditures on games and sports. Non-residents of the province bear approximately 61 per cent of the revenue raised from natural resources by Ontario and Ontario residents pay nearly 28 per cent of the revenue raised from this source by the other provinces.

Social insurance

All three levels of government receive pension contributions from public employees. In addition, the federal government receives contributions from employers and employees for unemployment insurance. The Province collects contributions

from firms in connection with its Workmen's Compensation and Industrial Employees' Vacations Programs.

All social insurance contributions are collected from either employees or employers. We assume that the total contributions paid by employees are borne by them. If, however, these mandatory contributions cause employees to work less, thereby increasing wages and prices, some of these contributions are shifted forward to consumers. Alternatively, if the contributions cause employees to work more, wages may actually fall and more than 100 per cent of the contributions made by employees rest on them. As we did for the personal income tax, we take the intermediate position and assume that exactly 100 per cent of the employee contributions is borne by them.

For our analysis, there are two classes of employers. When the government is the employer, we assume that its contributions are not shifted. The government contributions are not considered separately since they are taken out of general revenue, and thus are already included in the burden of other taxes. Where the government is not the employer, it is assumed that one-half of the employer contribution is shifted forward to consumers in the form of higher prices and one-half is shifted backwards to employees. This treatment of the employer social insurance contribution differs from our usual treatment of taxes that enter the cost of production. The employer social insurance contributions are not assumed to be completely shifted forward because, unlike most taxes that enter production costs, they are associated with a particular resource, labour, and directly benefit workers. Thus it is hypothesized that one-half of these contributions is an indirect form of wages and is borne by workers.

Approximately 81 per cent of the Ontario provincial and municipal social insurance contributions is borne by Ontario residents. Families in Ontario also bear 41 per cent of the federal social insurance contributions. The federal share borne by Ontario residents is high because of the large proportion of federal employees residing in the province.

Miscellaneous taxes and revenue

This miscellaneous category includes all of the remaining revenues collected by the various levels of government. However, some of these revenues are charges for services provided by the government. In these situations—e.g., the Post Office—where the revenue and expenditure would be distributed in the same manner, only the surplus or deficit is included. A deficit is considered an expenditure and a surplus is assumed to be a tax.

The Ontario provincial and municipal items included in this category are:

- (1) provincial hospital premiums
- (2) provincial tax on insurance premiums
- (3) other taxes such as the fire marshals tax and land transfer tax
- (4) miscellaneous provincial and municipal revenue from fines, licences, parking lots, etc.

The burden of the hospital premiums is assumed to be borne by the families paying them. In distributing the burden among the families, we assume that single

individuals pay one-half the amount paid by families of two or more. It is recognized that the premiums for some families are paid by the firm employing a member of the household. In these situations, part of the burden may be shifted forward to the consumers of the product by the firm. However, since there is no information on either the number of cases in which the employer pays the premium or on the amount of shifting when the situation does exist, we have neglected these cases in our analysis.

The provincial tax on insurance premiums is assumed to be borne by the purchasers of insurance in proportion to the amount of premium they pay. The chief justification for this assumption is that mutual insurance companies sell approximately 50 per cent of the insurance purchased by Ontario residents.²² Since the families who buy insurance from a mutual company also own the firm, they bear the burden through higher premium rates. These higher rates may be put into effect directly by increasing premiums or indirectly by reducing dividends. The tax on insurance sold by stock companies is also likely borne by the purchasers of insurance. This is because it is comparatively easy for stock companies to raise rates without a large loss in sales, when the rates charged by mutual companies increase. It also may be necessary for stock companies to raise rates to maintain the pre-tax rate of return to stockholders. If the tax is increased without an increase in insurance rates, the stockholders would shift their capital out of the insurance field. The provincial tax on automobile insurance premiums is distributed partially in proportion to expenditures on automobile purchase and operation and partially in proportion to total consumption expenditures.

Of the other taxes, the fire marshals tax and the land transfer tax are assumed to be borne in proportion to the property tax burden. The security transfer tax is borne in proportion to dividend income.

The remaining category of miscellaneous provincial and municipal revenue of approximately \$80 million is allocated to families in the following manner: one-fourth according to the number in the family, one-fourth equally to each family, one-fourth according to family income, and the remaining one-fourth in proportion to dividend income. This treatment of miscellaneous revenue is consistent with the treatment given to government expenditures that cannot be allocated to any particular group of families. Since the expenditures of this type are much larger and more numerous than the revenue items, the rationale behind this allocation formula is discussed in Chapter 4.

The federal revenue items included in this category are numerous. Some of the main components are fines and penalties, sales and services, licences and permits. This revenue is distributed in the same manner as the miscellaneous provincial and municipal revenue.

The miscellaneous taxes and revenues levied by the other provinces and municipalities included in this group are nearly the same as those listed above in connection with Ontario. In all cases, the shifting assumptions are the same as for the corresponding Ontario revenue items.

TABLE 3:3—Distribution of Revenues in Canada, 1961

	Family money income class					\$10,000 and over	Distri- bution to Ontario residents	Distribution to other Canadian and foreign residents	Total distri- bution
	Under \$2,000	\$2,000– 2,999	\$3,000– 3,999	\$4,000– 4,999	\$5,000– 6,999	\$7,000– 9,999			
				(thousands of dollars)					
Provincial Revenues (Ontario)									
Personal income tax.....	603	1,086	4,705	10,979	35,834	33,421	34,072	120,700	120,700
Corporation income tax.....	2,704	3,070	4,069	5,887	11,244	9,655	19,571	56,200	151,800
General sales tax.....	5,321	6,844	12,014	18,227	36,643	31,387	17,464	127,900	141,200
Highway-user revenues.....	3,009	5,449	10,356	23,706	45,873	38,199	20,208	146,800	247,100
Excise taxes.....	3,134	2,644	7,275	12,310	25,422	21,979	10,236	83,000	94,700
Succession duties.....	—	—	—	—	—	—	89,000	39,000	40,400
Natural-resource revenue.....	903	865	1,199	1,658	3,404	3,231	5,740	17,000	43,100
Social insurance contributions (includes \$9 million munic.).....	1,584	3,000	5,556	10,488	22,956	18,660	9,576	72,000	89,000
Hospital premiums.....	11,547	8,324	9,756	14,232	24,884	14,948	5,809	89,500	89,500
Other taxes and miscellaneous revenue..	2,400	2,123	2,930	4,435	18,283	6,287	6,042	32,500	44,700
Total.....	31,205	33,405	57,860	101,922	214,543	177,767	167,898	784,600	1,062,200
Municipal Revenues									
Property tax.....	38,745	29,816	40,157	61,245	110,505	80,438	64,094	425,000	564,500
Business tax.....	1,700	1,778	2,553	3,903	7,575	6,119	7,472	31,100	80,300
Miscellaneous revenue.....	3,920	3,201	4,052	6,191	10,861	7,707	6,768	42,700	52,300
Total.....	44,365	34,795	46,762	71,339	128,941	94,264	78,334	498,800	697,100
Total Provincial and Municipal Revenue.....	75,570	68,200	104,622	173,261	343,484	272,031	246,232	1,283,400	1,759,300
Federal Revenues									
Personal income tax.....	4,237	7,627	33,048	77,114	251,678	234,730	238,966	847,400	1,850,000
Corporation income tax.....	17,475	20,204	26,305	37,515	71,334	62,230	138,237	373,300	858,700
General sales tax.....	15,533	18,324	30,639	52,914	104,534	84,792	45,264	352,000	693,000
Other excises.....	9,529	9,749	17,984	29,238	57,935	39,232	17,733	181,400	623,000
Estate tax.....	—	—	—	—	—	—	34,500	34,500	71,000
Social insurance contributions.....	6,985	14,307	27,104	44,534	39,172	20,286	10,612	163,000	231,000
Import duties.....	11,166	10,806	16,749	26,835	52,769	40,523	21,523	180,100	354,900
Miscellaneous revenue.....	2,986	2,807	3,363	5,046	8,891	6,612	8,395	38,100	535,000
Total.....	67,911	83,824	155,192	273,196	586,313	488,405	514,959	2,169,800	5,857,800
Other Provincial and Municipal Revenue									
Corporation income tax.....	2,557	3,038	3,852	5,379	10,162	9,078	22,834	56,900	—
Highway-user revenues.....	2,892	2,872	4,481	7,257	14,352	10,982	5,764	48,600	—
Property tax.....	4,858	5,125	7,222	10,893	21,022	17,137	23,843	90,100	—
Natural resources.....	2,957	3,487	4,424	6,154	11,668	10,502	26,408	65,600	—
Other taxes and miscellaneous revenue..	649	963	1,286	1,700	3,424	3,312	9,766	21,100	—
Total.....	13,913	15,485	21,265	31,383	60,628	51,011	88,615	282,300	—
Total Revenue for All Levels of Government	157,394	167,509	281,079	477,840	990,425	811,447	849,806	3,735,500	—

Source: Table 3:1 and Appendix B.

EMPIRICAL RESULTS OF TAX ANALYSIS

The results of our investigation on the incidence of government revenue programs are summarized in Table 3:3. These results are obtained by distributing the revenue totals given in Table 3:1 among the seven income classes and the non-resident category. The bases for distributing the revenues are the assumptions of revenue incidence discussed in the previous pages, and the statistical series described in Appendix B. The values given for the seven income categories are merely an intermediate product in our analysis, but the proportion of each revenue program borne by non-residents is worthy of some attention. The proportion of provincial and municipal revenues borne by non-residents of Ontario is 27 per cent. The percentage borne by non-residents ranges from a high of 63 per cent and 61 per cent of the corporation income tax and the business tax respectively, to a low of zero for hospital premiums and the personal income tax. These percentages depend, of course, on our assumptions, and the true proportions may differ from these results. For example, if stockholders bear more than one-half of the corporation income tax, non-residents would bear a larger proportion of the corporate levy, and if Ontario firms have more difficulty passing on the forward-shifted portions of the corporation and business taxes to foreign as compared with domestic buyers, these percentages may be too high.

Although the proportion of each revenue borne by non-residents should be considered in designing the best revenue structure, this does not necessarily mean that more revenue should be raised from those sources where the foreign burden is large and less revenue where the foreign burden is low. First, our analysis is based on the fiscal relationships that existed in 1961 and our results describe the burden of revenue for that year. If tax changes are made, our assumptions, and consequently our conclusions, may be invalid. For example, if the Ontario corporation income tax rates were increased by 20 per cent, and if the corporate taxes of other jurisdictions did not change, our conclusions about the absolute and relative burden of the tax would likely be incorrect. Although the proceeds may increase by 20 per cent immediately after the tax increase, the tax would tend to discourage the growth of corporations in the province, thereby reducing the tax base and the amount of tax borne by non-resident stockholders. In addition, it would be very difficult for Ontario taxpaying corporations to shift any of the tax increase forward to consumers outside the province. Second, if all provinces formulated tax programs on the basis of placing the maximum burden on non-residents, fiscal relations between provinces would become more difficult. Third, an emphasis on revenues that are borne primarily by non-residents may not be consistent with the economic goals of the province and may result in an inequitable pattern of tax burden among the families in Ontario.

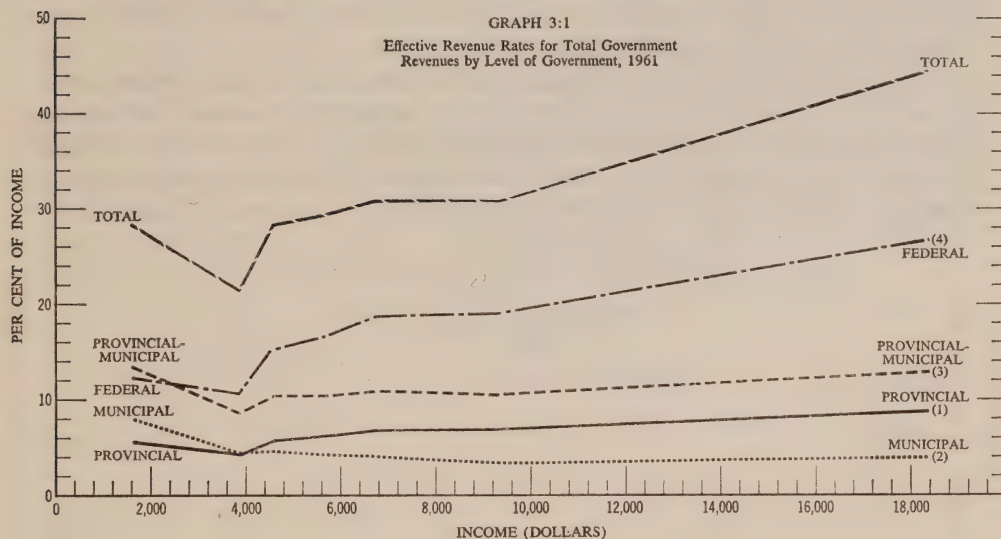
In order to present a more easily understood picture of the distribution of the revenue burden, we compute the proportion of income in each class that is absorbed by the various revenue programs. These effective rates of taxation are computed by dividing the revenues borne by the families in each class from Table 3:3 by the post-government income totals given in Table 2:1. These results are presented in Table 3:4. To aid in the interpretation of Table 3:4, we have con-

TABLE 3:4—Effective Revenue Rates for Government Revenues in Canada, 1961

	Family money income class						Average rates on an Ontario family
	Under \$2,000	\$2,000– 2,999	\$3,000– 3,999	\$4,000– 4,999	\$5,000– 5,999	\$7,000– 9,999	\$10,000 and over
	(percentage of post-government income)						
Provincial Revenues							
Personal income tax.....	.1	.1	.5	.7	1.2	1.3	1.1
Corporation income tax.....	.5	.4	.4	.4	.4	.4	.5
General sales tax.....	.9	.9	1.2	1.1	1.2	1.3	1.1
Highway-user revenues.....	.5	.7	1.1	1.4	1.5	1.5	1.3
Excise revenues.....	.6	.3	.7	.7	.8	.9	.7
Succession duties.....	—	—	—	—	—	—	.4
Natural-resource revenue.....	.2	.1	.1	.1	.1	.1	.1
Social insurance contributions.....	.3	.4	.6	.6	.7	.7	.6
Hospital premiums.....	2.1	1.1	1.0	.9	.8	.6	.8
Other taxes and miscellaneous revenue.....	.4	.3	.3	.3	.3	.3	.3
Total.....	5.6	4.3	5.9	6.3	7.0	7.1	6.9
Municipal Revenues							
Property tax.....	7.0	3.9	4.1	3.8	3.6	3.2	3.4
Business tax.....	.3	.2	.3	.2	.2	.2	.4
Miscellaneous revenue.....	.7	.4	.4	.4	.4	.3	.3
Total.....	8.0	4.5	4.8	4.4	4.2	3.7	4.1
Total Provincial and Municipal Revenue.....	13.6	8.8	10.7	10.7	11.2	10.8	12.9
Federal Revenues							
Personal income tax.....	.8	1.0	3.4	4.8	8.1	9.3	12.6
Corporation income tax.....	3.1	2.6	2.7	2.3	2.3	2.5	7.3
General sales tax.....	2.8	3.1	3.1	3.3	3.4	3.3	2.4
Other excises.....	1.7	1.3	1.8	1.8	1.9	1.6	.9
Estate tax.....	—	—	—	—	—	—	1.8
Social insurance contributions.....	1.3	1.9	2.8	2.8	1.3	.8	.6
Import duties.....	2.0	1.4	1.7	1.7	1.7	1.6	1.1
Miscellaneous revenue.....	.5	.4	.3	.3	.3	.3	.4
Total.....	12.2	11.0	15.8	17.0	19.0	19.4	27.1
Other Provincial and Municipal Revenue.....	2.5	2.0	2.1	1.9	1.9	2.0	4.7
Total Revenue for All Levels of Government.....	28.3	21.8	28.6	29.6	32.1	32.2	44.7
Alternative Calculations							
Ontario corporation tax (100% shifting).....	.7	.5	.6	.6	.6	.5	.4
Ontario corporation tax (zero shifting).....	.3	.3	.2	.2	.1	.2	1.6
Ontario sales tax (100% on factor incomes).....	.4	.8	1.0	1.0	1.1	1.2	1.2

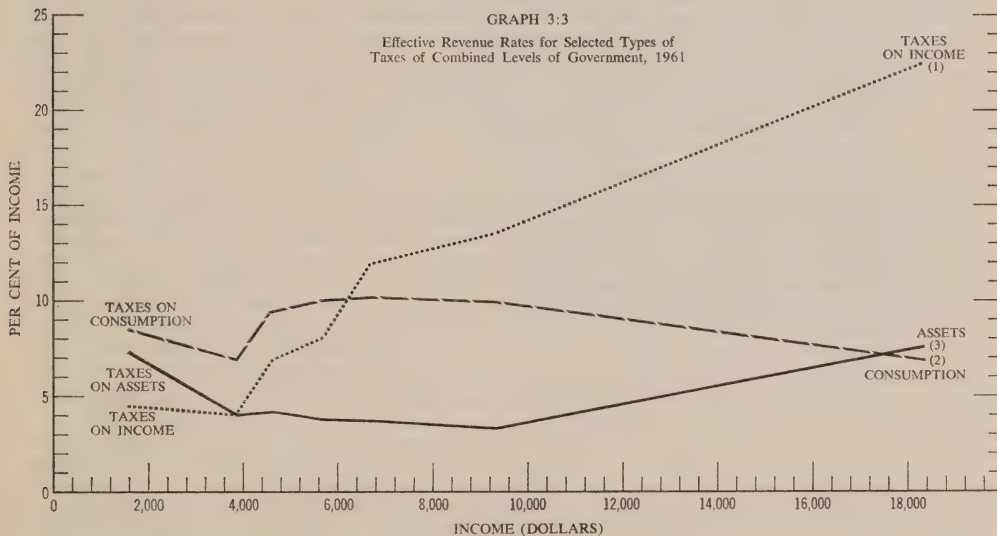
Source: Tables 2:1 and 3:3.

structed three graphs.²³ Before discussing each of the graphs, however, two cautionary notes should be made. First, given the shortcomings of our basic data, the absolute value of the effective tax rates may not be entirely correct. If, however, we can assume that all errors in the results are random, the relationships between the classes shown in the table are valid. Thus, major attention should be given to the relative revenue burdens borne by the families in each class. Second, we have no information on the distribution of burden within the \$10,000 and over category. Therefore, the portion of each graph devoted to this income class may not be entirely accurate. For example, our graph may indicate that a particular tax is proportional above \$10,000, when in fact it is progressive from \$10,000 to \$15,000 and regressive above that level.



In Graph 3:1 we present the pattern of the revenue burden separately for the provincial, municipal, combined provincial and municipal, federal and total categories. The Ontario provincial burden is mildly progressive throughout most of the income scale. An average family in the under \$2,000 category pays 5.6 per cent of its income to the Province, and an average family in a \$10,000 and over category pays 8.8 per cent. The only regressive feature in the burden pattern is in moving from the under \$2,000 to the next category: the percentage of income paid to the Province drops from 5.6 per cent to 4.3 per cent. This reduction in the rate is explained by the influence of the taxes distributed according to consumption expenditures and the hospital premiums. The Ontario municipal revenues are regressive over most of the income range. This regressive pattern reflects primarily the pattern of the property tax. The combined provincial-municipal burden pattern is U-shaped. The average rate of tax paid in the under \$2,000 category is 13.6 per cent, then falls to 8.8 per cent in the next category, and then moves steadily upward to 12.9 per cent in the highest income class. The regressive portion of the combined pattern is caused primarily by the property tax and the progressive part of

lowest income class and 1.8 per cent from an average family in the highest class. The corporation income tax is nearly proportional up to the largest income category, where it becomes progressive. This pattern arises because the forward-shifted portion of the tax is slightly regressive and the unshifted portion is slightly progressive up to the highest bracket where it becomes very progressive. Although the sales tax is slightly regressive at both ends of the income scale it is proportional throughout most of the scale. The inclusion of food in the base would make the tax very regressive in the low part of the income range and the inclusion of services in the base would likely result in a less regressive burden in the highest income bracket. The effective rate of the highway levies increases over the first three income classes, then becomes constant up to the \$10,000 and over category when it decreases. The tax borne initially by commercial vehicle owners is slightly regressive throughout the entire income range, but the portion borne by the passenger vehicle owners is progressive up to the highest income class. The burden pattern of the excise levies is at a lower level but has the same shape as the general sales tax pattern. The most regressive source of revenue at the provincial level is the hospital premiums paid by families. The burden is regressive throughout the entire income scale, ranging from 2.1 per cent in the lowest category to .3 per cent in the \$10,000 and over class. This regressivity in the burden occurs because each family pays the same monthly premium. Thus, the proportion of income that is paid to the government in the form of hospital premiums falls as income rises.



For Graph 3:3, we classify revenues by the revenue base rather than by level of government. We take most of the revenues received by all levels of government and place them in one of three categories:

- (1) Income
- (2) Consumption
- (3) Assets

The income category includes the federal and provincial personal and corporate income taxes. The consumption category encompasses the federal and provincial sales and excise taxes, import duties, liquor revenue and highway-user revenue. The asset-based category includes the property tax, business tax, estate tax and succession duty. The distributional pattern of revenues based on income is proportional over the first two income classes, slightly progressive over the next four classes and very progressive from the \$7,000-\$9,999 category to the \$10,000 and over class. The burden pattern of revenues based on consumption is regressive at both ends of the income scale and roughly proportional between the highest and lowest brackets. The revenues based on assets present a U-shaped pattern of burden. The combined property and business tax burden is regressive throughout nearly all of the income scale. This decline in effective rates is more than counteracted in the last income category by the revenue from the estate tax and succession duty. The average rate paid on these asset-based revenues in the lowest income category is 7.3 per cent. The average rate then moves steadily downward to 3.4 per cent in the \$7,000-\$9,999 category, and then turns up to 7.7 per cent in the highest income bracket.

FOOTNOTES

¹1961 *National Accounts* (Ottawa: Queen's Printer, 1962), Tables 55 and 21.

²The 37 per cent figure is the ratio of Ontario consumption expenditures to total Canadian consumption expenditures. This estimate is based on the following Dominion Bureau of Statistics publication: *D.B.S. Urban Families Expenditure in 1959* (Ottawa: Queen's Printer, 1963). The 50 per cent figure is arbitrary. It is reasonable to assume that Ontario residents consume a higher proportion of goods produced in Ontario than of goods produced in the rest of Canada, but the precise ratio cannot be determined. The 31 per cent figure is computed so that the weighted average of Ontario consumption of Ontario-produced goods (50 per cent) and the Ontario consumption of goods produced in the other provinces is equal to the Ontario consumption of Canadian-produced goods (37 per cent).

³In allocating the tax between foreigners and Canadians on the basis of investment we are assuming that the profitability and the average tax rate are the same for both categories of firms. We indicated in footnote 15 of the previous chapter that there is good reason for assuming that both categories of firms are equally profitable. However, on the question of the average tax rate there are two points worthy of note. On the one hand, foreign ownership is concentrated on large firms. This means that foreigners gain very little from the provision that allows profits below \$35,000 to be taxed at a low rate. On the other hand foreigners own over 60 per cent of the petroleum and mining industries. The profits of these industries are subject to a lower effective rate of taxation because of depletion allowances. Although the second factor is likely to be the more important, we judge that it would not change the ratio of tax to investment significantly.

⁴The 46 per cent figure is the ratio of dividends received by Ontario residents to total dividends received by Canadians. The 50 per cent figure is arbitrary. Since there are many small taxpaying corporations that are entirely owned by residents of the province, it is reasonable to assume that the proportion of the dividends paid by the Ontario taxpaying corporations is greater than the proportion of the dividends paid to Ontario residents by all Canadian taxpaying corporations. The 42 per cent is computed so that the weighted average of the proportion of dividends paid by Ontario taxpaying corporations to Ontario residents (50 per cent) and the proportion of dividends paid to Ontario residents by corporations taxed in the other provinces equals the ratio of dividends received by Ontario residents to total dividends received by Canadians (46 per cent).

⁵Tourists no doubt pay some of these commodity taxes through their purchases in Canada. We do not take account of these payments because they are minor and would complicate the calculations. However, we do take account of sales taxes levied on producer goods that are shifted forward to foreigners through Canadian exports.

- ⁶Estimate given by Ontario Department of Travel Research.
- ⁷The distribution of the federal income tax receipts by province is presented in Walter Gordon, *Reply of the Minister of Finance to Question No. 741 by Mr. Balcer*, made order for return Wednesday, July 22, 1964.
- ⁸The empirical studies on the topic indicate that work effort is not affected by the personal income tax. See, for example, George F. Brian, "Income Taxes and Incentives to Work", *American Economic Review*, Vol. 47 (September 1957), pp. 529-49, and R. Davidson, "Income Taxes and Incentive", *National Tax Journal*, Vol. 16 (September 1963), p. 293-9.
- ⁹The case for forward shifting is given in N. Krzyzaniak and Richard A. Musgrave, *The Shifting of the Corporation Income Tax* (Baltimore: The Johns Hopkins Press, 1963). For an argument for zero shifting, see Arnold Harberger, "The Incidence of The Corporation Income Tax", *Journal of Political Economy*, Vol. 70 (June 1962) p. 214-40.
- ¹⁰For a thorough analysis of the impact of these factors on the incidence of a commodity tax the reader is referred to Kenyon Poole, *An Analysis of the Retail Sales Tax*, a study to be published by the Ontario Committee on Taxation.
- ¹¹For a discussion of the controversy see John F. Due, *Government Finance*, 3rd edition (Homewood, Illinois: Richard D. Irwin, 1963), pp. 275-84.
- ¹²In both the immediate and short-run cases the relative shares of the tax borne by the purchasers and firm owners depends on the nature of the supply and demand curves. Owners will bear a greater proportion of the tax if the demand is relatively elastic and supply relatively inelastic than if the opposite conditions exist. The portion of the tax borne initially by the firm owner may be shifted backwards to the owner of resources employed by the firm. The amount of tax borne by each resource owner depends on the supply and demand relationships for the resource.
- ¹³The estimate of 37 per cent is taken from a yet unpublished study for the Royal Commission on Taxation by M. Bourgeois, "Sources of Sales and Excise Tax Revenue, 1963". The 17 per cent estimate is taken from Musgrave and Daicoff, *op. cit.*, p. 133, 142. Although their study was conducted for Michigan, the structures of the Ontario and Michigan taxes are very similar.
- ¹⁴This estimate is based on information supplied by the Ontario Department of Travel Research.
- ¹⁵This estimate is based on information supplied by the Ontario Department of Transport.
- ¹⁶The excise tax on automobiles was repealed in 1962.
- ¹⁷We originally assumed that the entire Ontario tax is borne by residents of the province but changed this to 97 per cent in light of data supplied by the Ontario Department of Treasury, Succession Duty Branch. This information was supplied after the original calculations were completed for this study. Although we did take account of the change in order to be consistent with the Report of the Committee we did not make the logically consistent change of assuming that part of the tax levied by other provinces is borne by Ontario residents. This logical error is quantitatively unimportant since the amount that should be added to tax burden of Ontario residents is less than \$1.0 million.
- ¹⁸These assessment data were provided by the Ontario Department of Municipal Affairs.
- ¹⁹These data for Ontario were taken from the data collected for Dominion Bureau of Statistics study *Income Liquid Assets and Indebtedness of Non-Farm Families in Canada 1958*.
- ²⁰For a more thorough discussion of the incidence of the property tax see Herbert A. Simon, "The Incidence of a Tax on Urban Real Property", in *American Economics Association Readings in The Economics of Taxation*, Richard A. Musgrave and Carl S. Shoup, Eds. (Homewood: Irwin, 1959), pp. 416-35.
- ²¹For further information and analysis of the business tax, readers are referred to William Merritt, *The Ontario Business Tax*, a study to be published by the Ontario Committee on Taxation.
- ²²In testimony given before the Royal Commission on Taxation, the Canadian Life Insurance Association stated that the total business at the end of 1962 was split 60-40 between mutual and stock companies. (January 6, 1964.)
- ²³It should be noted that the horizontal axis of all the graphs is in terms of *post-government income*. Thus, the average income in some of the *family income* classes exceeds the upper limit of the class.

CHAPTER 4

Incidence of Government Expenditure Programs

IN THE previous chapter, we estimated the distribution of the burden resulting from government revenue programs. The objective of this chapter is to construct a similar distribution for the benefits arising from government expenditures. These revenue and expenditure estimates are then brought together in the next chapter to measure the effect of government fiscal activity.

The burden pattern of taxation is a very important factor in making a selection among various methods of raising a fixed amount of revenue. As mentioned previously, however, the examination of taxes alone gives an incomplete and distorted view of the impact of government fiscal activity on the income distribution. The impact of expenditures, as well as of revenues, is important in determining the proper level and composition of government fiscal activity. The benefits of the goods and services provided by the public sector should be considered along with the burdens involved in covering the costs of government. For example, it may be that the burden of government is distributed in a progressive manner. This income-levelling effect of the revenue programs may then be used as an argument for larger government. If, however, the distribution of government expenditures is very regressive, the net effect of government is to make the income distribution more unequal. In this case, the above argument for a higher level of fiscal activity would be incorrect. A distorted view of a new government program could also result from examining only the tax burden. For example, if the new activity is financed from an increase in the property tax, the tax burden is likely to be regressive. If the benefits of the new activity are very progressive, however, the combined effect of the tax and expenditure is to level incomes.

Since the chief objective of this study is to measure the impact of government fiscal activity on the income distribution, the pattern of expenditure incidence is very important. When conclusions about the effects of government fiscal activity are based on the pattern of tax incidence only, an implicit assumption is made concerning the incidence of expenditures. This implicit assumption is that expenditures are proportional to income. Although this assumption may be true for some government expenditures, there are many that do not fit this pattern. For example, welfare payments benefit low income families more than families with high incomes. Thus, even though the difficulties involved in estimating the pattern of expenditure incidence are even greater than those encountered with government revenues, it is preferable to explicitly derive the distribution of expenditures than to implicitly assume that they are proportional to income.¹

In estimating the distribution of government expenditures, we follow nearly the same steps as those that led to the distribution of tax payments. First we select the expenditure items included in the analysis. Next we examine the incidence of

each expenditure item. The assumptions we employ in distributing the expenditures are based on theoretical hypotheses and empirical investigations. On the basis of these assumptions, the non-resident share of each expenditure is deducted, and the remainder is distributed to Ontario families. As with the revenue side, effective rates of expenditure are then computed by dividing the distribution of expenditure by the distribution of income.

Government expenditures are of two types—transfer payments and expenditures on goods and services. Transfer payments are payments made directly by the government to families and are intended to raise the incomes of the families receiving them. Transfer payments include such items as old age pensions, unemployment compensation and family allowance payments. In our analysis, transfer payments are treated as negative taxes. Although the benefits of the payments may be shifted from the initial recipients, transfer payments directly augment the income of families in the same manner as taxes reduce income. This means that just as the burden of taxation is equal to the reduction in income, the benefit of transfer payments is equal to the addition in income. Thus, the total amount of each transfer payment is simply allocated to the families whose incomes have risen as a result of the payment.

The allocation of benefits arising from government expenditure on goods and services is much more difficult. There is often no charge for a government-produced commodity and it is difficult to determine the value placed on it by any family or group of families. At one extreme all of the families using a particular commodity may place a value on it that exceeds the production costs. At the other extreme the cost may be greater than the value placed on it by any family. However, in the most likely situation, the value of the commodity for some families exceeds, and for others the value will be less than, the cost. Since the commodities are generally offered free of charge, families do not directly indicate the value they place on each good or service. Thus, it is impossible to determine the total amount that should be added to the income of families for each expenditure. Even if we assumed that the total value placed on each commodity by all the families is equal to the cost of it, we would still be lacking the necessary information regarding the distribution of the total value. For example, even if total value equals total cost, low income families may place a value on it that exceeds costs and high income families may place a value on the commodity that is less than the costs of producing it. Given these insurmountable problems, we have adopted a cost-occasioned method of distributing government expenditure on goods and services to families. This method, which is a variation of the benefit method, involves distributing the cost of providing a commodity to families in proportion to their use of it. This cost-occasioned method is equivalent to assuming that not only does total value equal total cost for each commodity but the value placed on it is equal to the cost of providing it for each family. Therefore, the amount added to the income of families for each good or service provided by the government is equal to the total cost of providing it, and this increase in income is distributed in proportion to the use of the commodity.²

In allocating the government expenditures on goods and services, we take account only of the direct beneficiaries of them. Although there are many expendi-

tures that yield indirect benefits for all families, we have omitted these benefits. For example, even though educational expenditures likely yield benefits to all families through technological advances, lower delinquency rates and a better-educated electorate, we distribute the total expenditure on education among families in proportion to the number of students in the family. These indirect benefits are neglected for three reasons:

- (1) the proper ratio of direct to indirect benefits is not easily determined,
- (2) indirect burdens are not considered on the revenue side, and
- (3) the rationale behind the cost-occasioned method makes no allowance for the indirect benefits.

This omission of indirect benefits does not preclude, of course, the shifting of benefits accruing initially to firms to the families who ultimately benefit from the expenditure.

For our analysis, government expenditures are grouped into two categories. The beneficiaries of some expenditures are quite easily identified. These expenditures, classified as specific, include such items as expenditures on health, education, highways and agriculture as well as transfer payments. The incidence of each expenditure in this category is discussed separately. Although there is fairly widespread agreement on the incidence of these items, the principal alternative hypotheses are also analysed.

Those expenditures that cannot be easily allocated to any specific group of beneficiaries are classified as general. The incidence of the items in this group, which includes expenditures on national defence, general government and protection to persons and property, is not at all certain. There is no empirical evidence, or agreed-upon theory, that relates the benefits from these services to families classified by income. These expenditures are grouped together and are allocated by a method that is a compromise between several alternative hypotheses. The method of allocating these general expenditures is very arbitrary and the amount of expenditure in this category is approximately one-third of the total. Since these expenditures are a significant proportion of the total, we present our results both including and excluding general expenditures. However, we judge that when analysing the total effect of government on the income distribution, it is better to include all expenditure items rather than only the specific ones. This is because the inclusion of all the taxes and only two-thirds of the expenditures would give an incomplete view of the government's impact on the income distribution.

In order to measure the total benefits of government, and to be consistent with our treatment of revenues, we include all government expenditures in our analysis. All expenditures are of benefit to at least some families, and there appears to be no reason for omitting some items and not others. As mentioned previously, it is those expenditures that nearly everyone agrees are proper and important functions of government, such as national defence and protection of persons and property, that are the most difficult to allocate to families.

In order to be consistent with the revenue side of the budget, we take as the primary sources of data the D.B.S. publications that present expenditures by level of government.³ In these publications, the expenditure items are grouped into

functional categories. In presenting these data all unconditional grants and subsidies from one level of government to another are omitted from the expenditure side of the paying government and the income side of the receiving government. This means that municipal expenditures that are made as a result of provincial unconditional grants are shown as municipal rather than provincial expenditures. Conditional grants, however, are shown as an expenditure of the paying government. Consequently, provincial grants to municipalities for streets and bridges are classified as provincial expenditures.

These published data are adjusted for our purposes to include expenditures made from government trust funds. The chief additions are unemployment and workmen's compensation payments. These expenditures are added because they are as much an addition to income as are family allowances and payments to veterans.

As is true of taxes, a portion of the government expenditures accrues to non-residents. Non-residents of the country benefit from government expenditures primarily through ownership of businesses located in Canada and through consumption of commodities produced in the country. To a lesser extent, they also benefit as tourists of Canada. Canadians residing outside Ontario also benefit from the Ontario provincial and municipal expenditures. We assume that benefits are shifted to non-residents in the same manner that taxes are borne by them. This means that after subtracting the foreign share of the expenditures that accrue to owners of corporations, Ontario residents receive 50 per cent of the provincial expenditures, 46 per cent of the federal, and 42 per cent of the other provincial and municipal expenditures. For the benefits allocated in proportion to consumption of all goods and services the percentages of expenditures accruing to Ontario residents are 50 per cent, 37 per cent and 32 per cent respectively.

Table 4:1 shows the total expenditures of the federal, provincial and municipal governments. The table also illustrates the amount of federal, Ontario provincial and municipal and other provincial and municipal expenditures that accrue to Ontario residents.

At the provincial level, the largest expenditures are on education, roads, health and sanitation and welfare. These items account for over 80 per cent of the total provincial expenditures. The largest component of municipal expenditure is education, accounting for nearly 36 per cent of the total. At the federal level social welfare is the largest specific expenditure category, accounting for one-third of the total federal expenditures. However, the general category is the largest item, encompassing over 39 per cent of total federal expenditure. The chief reason for the large general category at the federal level is that national defence is classified as a general expenditure.

As indicated by the previous table, there is a large variance in the amount of each expenditure that accrues to non-residents of the province. The proportion of Ontario provincial and municipal expenditures that is received by non-residents ranges from nearly 70 per cent for interest payments to 0 per cent for education, social welfare and some expenditures on health. The proportion of the total provincial and municipal expenditure accruing to non-residents is approximately one-half of the percentage of revenue borne by families residing outside Ontario.

TABLE 4:1—Government Expenditures Received by Ontario Residents, 1961

Expenditure item	Ontario				Federal		Other provincial and municipal—	Total Ontario receipts
	Provincial		Municipal		Total	Ontario share*	Ontario share*	
	Total	Ontario share*	Total	Ontario share*				
(millions of dollars)								
Highways, roads and bridges.....	246.2	174.0	134.2	96.5	89.0	34.9	39.8	345.2
Other transportation† and communication	—	—	—	—	305.0	80.4	—	80.4
Education.....	271.0	271.0	343.6	343.6	93.0	36.0	—	650.6
Health and sanitation	228.4	228.4	139.1	114.6	366.0	125.3	6.5	474.8
Interest.....	49.4	17.6	40.2	12.9	653.4	240.8	19.5	290.8
Social welfare‡.....	116.8	116.8	27.3	27.3	2,266.0	772.2	—	916.3
Agriculture.....	9.5	9.5	—	—	295.0	118.1	—	127.6
General expenditure§.	142.5	118.6	274.4	229.5	2,678.4	945.7	55.9	1,349.7
Total.....	1,063.8	935.9	958.8	824.4	6,745.8	2,353.4	121.7	4,235.4

Sources: D.B.S., *Financial Statistics of the Government of Canada, 1961*; *Financial Statistics of Provincial Governments, 1961*; *Financial Statistics of Municipal Governments, 1961*; and Appendix B. Municipal data refer to calendar year, federal and provincial data to nearest fiscal year.

*The amount of expenditure received by non-residents of Ontario is estimated. This estimate is based on both the basic assumption regarding the incidence of each expenditure and the general assumption that political boundaries are no bar to receiving benefits from government expenditures.

†Includes expenditure on air, water and rail transport.

‡Includes Old Age Security payments, family allowances, government pensions, payments to veterans, unemployment insurance and other miscellaneous transfer payments.

§The major components in this general category are defence services, mutual aid, general government, protection of persons and property, recreation and cultural services, natural resource and primary industries and payments to government enterprises.

ALLOCATION OF GOVERNMENT EXPENDITURES

We discuss the allocation of each government expenditure. For some expenditures, we analyse alternative hypotheses of incidence. In all cases, we explain the rationale behind the theoretical hypothesis that we have accepted. The end product of this section of the chapter is the distribution of government expenditures by income class.

Highway, Road, Street and Bridge Expenditures

The allocation of these expenditures is complex because of the widespread shifting of benefits and because there are several categories of beneficiaries. We first summarize our results and then explain the reasoning behind them.

We assume that the benefits from these expenditures are initially received by three categories of recipients. These recipients are the owners of:

- (1) property
- (2) passenger vehicles, and
- (3) commercial vehicles.

We further assume that the entire expenditure accruing to commercial vehicle owners is shifted forward to consumers in the form of lower prices and that approxi-

mately 25 per cent of the property share⁴ is also shifted forward. The benefits allocated to property owners are distributed in the same manner as the distribution of property assessment and the benefits to passenger and commercial vehicle owners are distributed to the two groups in the same manner as the burden of the gasoline tax. This means that non-resident property owners, tourists and consumers receive respectively 25, 20 and 59 per cent of the provincial and municipal expenditures that are allocated to these groups of beneficiaries.

Expenditures on roads benefit both users and non-users. Road users receive the benefits of time saved, lower operating costs, and fewer accidents. All these benefits result in lowering the cost of operating a motor vehicle. For a passenger vehicle owner, this reduction in cost is similar to an increase in income and we assume that this benefit is not shifted.⁵ The commercial vehicle owners also obtain a reduction in costs due to additional expenditure on roads. Analogous to the case where taxes enter the cost of production, we assume that this reduction in costs brings more resources into the industry, thereby increasing competition and lowering commercial freight and passenger rates. Thus, the benefits of road expenditures are assumed to be shifted from commercial vehicle owners to consumers.

In the non-user category, property owners benefit from road expenditures because roads provide access to property. Although it could be argued that roads are built and maintained only for the use of motor vehicles, many road expenditures, such as those on rural roads and residential streets, are incurred primarily to provide access to property. Property owners also benefit from the construction of through streets, if not directly adjacent to the construction, because property values will normally rise when transportation time is reduced. For these expenditures, we judge that it is more reasonable to distribute the benefits to property owners than to users. These benefits to property owners are additions to income, just as property taxes reduce income. Therefore, the benefits are distributed in the same manner as the property tax assessments.

Although neglected in our analysis, there are two other groups of non-user beneficiaries that are often cited. These two groups are consumers and the general public. For consumers, it is argued that better roads result in faster delivery, fresher commodities and lower costs. We agree that consumers do enjoy these benefits but argue that they have already been counted in the benefits initially received by the owners of commercial vehicles. It is also argued that the general public benefits from a better road system because of improved national defence, the developing of new geographic areas and the improvement in fire and crime control. Although this argument may have some merit, we have accounted for many of these benefits in the portion allocated to property owners and have made the general assumption that any "indirect" benefits are neglected whenever direct beneficiaries can be identified.

Now that we have identified the beneficiaries of road expenditures and have analysed in general terms the incidence of these expenditures, there still remain two problems. One is to allocate the expenditures between users and non-users. The second is to distribute the user share among the different categories of users.

There are over ten methods that have been advocated for solving the problem of allocating road costs between users and non-users. Each method is based on

different assumptions; none of them is free from some criticism. The formula adopted for our analysis is called the *Earnings Credit Method*. It is derived from some of the less sophisticated methods and thus the use of it tends to give results that are close to the average of the results obtained by applying all of the suggested formulas. We use the Earnings Credit Method not only because it is superior to many of the others on theoretical grounds, but because it is by far the most commonly adopted method in highway studies.⁶ The Earnings Credit Method assumes that the primary road system, which includes the King's Highway and urban expressways, provides very little access to property and that the entire benefits accrue to road users. This method also assumes that the expenditures on residential city streets and township roads are entirely for the benefit of property owners. This method is implemented by the calculation of two ratios. The share of expenditures allocated to road users is then computed by taking the average of the two ratios. One ratio is calculated by

- (1) computing a rate per vehicle mile that would cover the cost of constructing and maintaining the primary road system,
- (2) multiplying this rate by the total vehicle miles driven on each class of road, and
- (3) summing these products and dividing by the total expenditure on roads.

The second ratio is calculated by

- (1) computing a rate per *road mile* that covers the cost of constructing and maintaining local roads,
- (2) multiplying this rate by the total road miles in each class of roads, and
- (3) summing these products and dividing by total expenditure.

This ratio gives an estimate of the non-user portion and is subtracted from 1 to obtain an estimate of the percentage of benefits that accrue to road users. These two ratios are then averaged and the resulting percentage is the portion of road expenditures that accrues to road users. For Ontario provincial and municipal expenditures taken together the Ontario Department of Transport estimates that the user share is 68 per cent and the non-user share is 32 per cent.⁷

For the problem of allocating the user share among the categories of users, there are again several methods that could be used. We have selected the *Incremental Cost Method* because, although far from perfect, it is generally rated as the best available method when examined on theoretical grounds, and because it was used by the Ontario Department of Transport. This formula neglects non-users completely and concentrates on the allocation of road costs among users. In implementing this method, vehicles are classified by weight and axle weight. Costs are classified into common and specific categories. Common costs are costs necessary to provide a road for even light vehicles. Specific costs are additional costs necessary to provide a road for successively heavier vehicles. Common costs are allocated to all vehicles in proportion to the vehicle miles driven. Each specific cost is allocated to all vehicles needing the specific expenditure. For example, in providing a fifteen-inch roadbed, the first eight inches may be necessary for even the lightest vehicle, the next three inches necessary for any truck and the last four inches for trucks over eight tons. The cost of the first eight inches would be then

spread over all the vehicles, the cost of the next three spread over all trucks, and the cost of the last four inches allocated to trucks over eight tons. Using the data obtained from the Ontario Department of Transport, we conclude that approximately two-thirds of the user share should be apportioned to passenger vehicle owners and one-third to commercial vehicle owners.

Expenditures on Other Transportation

These federal expenditures are for air, water and rail travel facilities. Illustrations of items included in this category are expenditures on harbours and terminals, and subsidies to shipbuilders and railroads. These expenditures increase transportation facilities. As opposed to the situation with roads, however, there is no empirical evidence on which to allocate the expenditure between users and non-users. Thus, we have arbitrarily assumed that one-half of the expenditure accrues to firms and one-half directly to families. We also assume that the portion received by firms is shifted forward to consumers and that the portion accruing directly to families is not shifted. The first portion is distributed to families in proportion to their consumption expenditures, and the last portion is distributed in proportion to family expenditure on air, water and rail transportation. Foreigners receive 18 per cent of the benefits accruing initially to firms and approximately 28 per cent of the benefits received directly by families. Of the remainder, Ontario residents received 37 and 31 per cent of the benefits respectively.⁸

Expenditures on Education

There are expenditures on education at all three levels of government. Federal expenditures encompass the expenditures on the education of Indians, Eskimos and residents of the Northwest Territories, part of the vocational training costs and grants to universities. At the provincial level, over two-thirds of the expenditures are in the form of grants for locally operated elementary and secondary schools. Most of the remainder is spent on higher education. There is also a small amount spent on vocational training and educating the handicapped. The municipal expenditure is devoted almost entirely to elementary and secondary education.

For all expenditures on education, we assume that the benefits accrue only to the recipients of the education. As we mentioned previously, this does not mean that we deny the existence of "indirect" benefits arising from education but that because of the difficulty of determining the ratio of "direct" to "indirect" benefits, we have allocated all expenditures to the direct beneficiaries of education. Since all benefits accrue to families classified by income, this means that these benefits are allocated to families in each class in proportion to the number of children receiving education. We also assume that all federal expenditures accrue to Canadian residents and all the Ontario provincial and municipal expenditures accrue to residents of the province.

For our purposes, we separate education expenditures into two categories. One category includes expenditure on universities. The second comprises mainly expenditures on primary and secondary education but encompasses all education

expenditures except those on higher education. The distribution of expenditures on these two categories by level of government is shown in Table 4: 2.

The methods used to distribute both of these expenditure items are based on some very arbitrary assumptions. We discuss these methods in detail so that the reader may be aware of the possible error in the results. The basic data for the percentage frequency distribution used to allocate expenditure on higher education are taken from a survey of student incomes and expenditures conducted by D.B.S. in 1957.⁹ These data for all of Canada are brought forward to 1961 by Professor W. I. Gillespie,¹⁰ using the assumption that attendance in colleges and universities is directly related to income. We further adjust his statistical series to make it applicable for Ontario by the use of the same assumption. To the extent that the variables, other than income, that affect college attendance have changed over the period, we have introduced an unknown error in our results.

TABLE 4:2—Expenditure on Education

	Provincial	Municipal	Ontario share of federal expenditures
(millions of dollars)			
Universities.....	57.8	.0	23.0
Primary, secondary, and all other...	213.2	343.6	13.0
	271.0	343.6	36.0

Source: This table is based on the statistics presented in the government documents described in Appendix A, and the operations performed on these data are described in Appendix B.

If the average age of children rises with family income, our method of distributing the second category of education expenditures likely overstates the progressivity of these expenditures for two reasons. First, the percentage frequency distribution employed to distribute these expenditures is for children sixteen and under. The distribution is incorrect because it includes pre-school children and because it excludes those children above sixteen who attend secondary schools. Thus, since income likely rises with the age of the head of the family and consequently the age of children, we are likely allocating too large a proportion of education expenditures to the low income families and too small a proportion to the high income families. Second, we implicitly assume that the cost of educating an elementary school student is the same as the cost of education of a secondary school student. If the expenditure is higher for a secondary school student, we have again allocated too much to low income families and too little to those with high incomes.

Although our methods of distributing education expenditures are open to some question, there appears to be no superior alternative. For the expenditures on higher education, it seems reasonable to assume that any errors are random and thus do not affect the relationship between income classes. For the other education expenditures, it is likely that we have overstated the progressivity of the inci-

dence but it may be that the high income families send their children to private schools in sufficient numbers to compensate for the possible errors mentioned above.

Expenditure on Health and Sanitation

All three levels of government make expenditures on health, but sanitation expenditures are made only at the municipal level. For our analysis, expenditures are classified into three categories. The first and largest category is expenditure on hospital care. The second includes general public health expenditures such as general medical research, preventive public health programs, and medical, dental and allied services. The third category is sanitation which encompasses local expenditures on sanitation, waste removal and sewage disposal. The percentage distribution of expenditures on these three categories by level of government is shown in Table 4:3.

TABLE 4:3—Expenditures on Public Health and Sanitation

	Provincial	Municipal	Ontario share of federal expenditures
Hospital care.....	94.5%	0.0	86.1%
Public health.....	5.5	25.8%	13.9
Sanitation.....	0.0	74.2	0.0
	100.0	100.0	100.0

Source: This table is based on the statistics presented in the government documents described in Appendix A, and the operations performed on these data are described in Appendix B.

Government expenditures on hospital care are a result of the government-sponsored hospitalization plan. The hospital insurance plan is a provincial program, but it was instituted with the encouragement of the federal government and federal grants for this purpose are substantial. In 1961 \$216 million of Ontario provincial funds and \$108 million of federal funds were spent on the Ontario plan. In Ontario there is compulsory coverage for persons subject to payroll deductions and voluntary enrolment for other persons. The Plan provides standard ward care for in-patients, emergency service for out-patients, and out-of-province hospitalization for residents who become ill away from home.

It is difficult to allocate these expenditures to families because there are no available data relating hospital care to income. We have assumed that there is no relationship between hospital care and income and that each individual in the province receives equal benefit from these expenditures. Thus, these expenditures are distributed according to the number of individuals in each income class. In addition to some imperfections in our percentage frequency distribution, there exists the possibility that low income individuals are hospitalized for greater periods than high income individuals because of inferior diets and because medical care is not utilized in the early stages of illnesses. To the extent that this is true, all results understate the progressivity of these hospital expenditures.

The expenditures on general public health programs are primarily for prevention and control of illness and disease. These include expenditure for the control of tuberculosis and cancer, medical research, rehabilitation, health surveys and local boards of health. A small amount of expenditure in this category is also incurred in providing medical service to those who are not protected through private medical plans. In 1961 the provincial and municipal expenditure and the Ontario portion of federal expenditure in this category were \$16 million, \$30 million and \$17 million respectively. Many of these general services such as the reduction in communicable diseases and health information and warnings are enjoyed on a family basis. Other services such as medical research on cancer and heart disease accrue to all individuals equally. Thus, we have distributed one-half of the expenditures in this category to income classes in proportion to the number of families in each class, and the remaining one-half in proportion to the number of individuals in each class.

There are two groups of beneficiaries that initially receive benefits from expenditures on sanitation. These two groups are business firms and residents. The cost of operating either a business or a home is reduced through waste removal and sewage disposal programs. Since there is no available information on the proportion of benefits enjoyed by each group of beneficiaries, we utilize assessment data to make the division. We assume that the percentage of benefits accruing to business is equal to the ratio of business assessment to total non-farm assessment. This calculation yields an estimate of 38 per cent for the business share and 62 per cent for the residential share. Property values are utilized in allocating expenditure because waste removal and sewage disposal are directly related to property. Although these services are not perfectly related to the value of the property, there appears to be no superior method of allocating the costs between the business and residential sectors. Assessment data rather than tax data are used because the residential taxes are reduced by provincial grants. Farm property is omitted from this analysis because it is judged that the benefits farmers receive from these expenditures are negligible.

We assume that the benefits of expenditures that accrue initially to businesses are completely shifted forward to consumers in the form of lower prices. This is because nearly all of the sanitation expenditures reduce operating costs. As argued in connection with the highway expenditures, all expenditures that decrease the variable costs of producing a good or service are assumed to be shifted forward. For the residential share, we assume that each family, whether renter or homeowner, benefits equally from the sanitation expenditures accruing to the residential sector.

Interest Payments

Governments at all three levels issue interest-bearing securities to cover accumulated deficits. The interest payments on these securities are substantial. At the federal level, approximately 10 per cent of total expenditure is devoted to servicing the debt.

Interest payments could be treated in at least two ways. On the one hand it could be argued that interest payments are similar to wages paid civil servants in

that they are a cost incurred in providing a government good or service. For example, if funds are borrowed to construct a school or hospital, the interest costs on the borrowed funds are a part of the cost of providing education or hospital care. If this point of view is adopted, the benefits of interest payments should be allocated to families in proportion to their use of debt-financed goods and services. On the other hand, it could be argued that interest payments are transfer payments whose purpose is to redistribute income in the course of providing debt-financed goods and services. If this point of view is adopted, interest payments should be allocated to the families that receive the payments.

Although we recognize that the first point of view could be validly adopted, we accept the second view for several reasons. First, interest payments are treated in the Canadian National Accounts as transfer payments. Second, it would be very difficult to estimate the proportion of debt-financed goods and services consumed by families in each income class. Third, interest payments are generally accepted as a means of redistributing income.

In allocating interest payments to the recipients of the payments we utilize information on the holding of government securities. These securities are held by three major groups:

- (1) individuals
- (2) businesses
- (3) governments.

The business category includes chartered banks, insurance companies, Quebec savings banks, trust and loan companies, industrial pension plans, other financial institutions, and non-financial corporations. The government category comprises the Bank of Canada, the federal government accounts, and provincial and municipal government accounts.

Before examining the incidence of interest payments made to each category, one assumption implicit in our analysis should be noted. In allocating the interest paid on the debt of each government, we assume that the percentage received by a particular category of holders is equal to the proportion of the debt held by it. Since the interest paid on securities varies, this assumption may introduce some error into the analysis. For example, if the benefits of high-interest-bearing securities accrue to low income families, and the benefits of low-interest securities are received by those families with high incomes, we understate the progressivity of interest payments. The reverse situation is also possible. We judge, however, that any error caused by using this assumption is negligible.

Many individuals buy and own government securities. As of December 31, 1961, 22 per cent of the federal debt was composed of Canada Savings Bonds, and another 15 per cent of the debt, in the form of market securities, was held by Canadian residents. At the provincial and municipal levels of government nearly 20 per cent of the combined debt was held by resident owners.¹¹ We assume that the interest paid on these securities is not shifted, and thus directly benefits the owners of the debt. The proportion of the federal interest paid to Ontario residents is equal to the ratio of liquid assets held by residents of the province to total liquid assets held by Canadians. One-half of the Ontario provincial and municipal

interest paid to individual owners is deemed to accrue to residents of the province. We also assume that Ontario families received approximately 42 per cent of the interest paid by the other provincial and municipal governments to Canadian residents.

Approximately 35 per cent of the federal debt and 36 per cent of the combined provincial and municipal debt is held by businesses. The largest holders of the federal debt in this category are the chartered banks, which hold 15 per cent of the securities. At the provincial and municipal level, insurance companies are the leaders with 15 per cent. All interest initially received by this sector ultimately accrues to individuals. Except for insurance companies, where we assume that the interest is shifted forward to purchasers of insurance, we assume that all of the interest benefits the owners of business. For chartered banks and non-financial corporations, we distribute interest in the same manner as corporate dividends. In the remaining sub-category of savings banks, trust and loan companies, and other financial institutions, interest is distributed according to the ownership of liquid assets. The rationale for assuming that the interest paid to insurance companies is shifted forward is the same as the argument for the forward shifting of the tax on insurance premiums. Briefly, this is because mutual companies are dominant in many insurance areas and that income received by these companies is distributed to its owners through lower premiums. The interest paid to chartered banks is assumed to accrue to the stockholders of the banks because of the structure of the industry and because charges to bank customers do not appear to be very responsive to changes in the interest rate. However, there is no conclusive evidence on this point, and to the extent that the benefits are shifted forward to bank customers, we have understated the progressivity of these interest payments.

Governments receive 24 per cent of the federal interest payments and over 21 per cent of the interest paid by provincial and municipal governments. At the federal level, the chief owner of government securities is the Bank of Canada, although some is held in government trust funds. Some federal, provincial, and municipal securities are also held in provincial and municipal trust funds. We completely omit interest paid to government from our analysis. This is because we assume that if governments had not received the interest, the equivalent amount of revenue would have been raised from other sources. Thus, the benefits to families arising from the interest paid on government-held securities is already accounted for on the revenue side through a lighter tax burden. To add these benefits on the expenditure side would involve double counting.

Foreigners receive benefits from interest payments in three ways. First, they directly own 4 per cent of the federal and 23 per cent of the combined municipal and provincial debt. Second, 34 per cent of the interest paid to non-financial corporations and chartered banks accrues to foreign investors. Third, 18 per cent of the interest received by insurance companies accrues to foreign policy-holders.

The method of distributing interest payments among the categories of recipients is very involved but the results of our computations are shown in Table 4:4.

TABLE 4:4—Distribution of Interest Payments to Ontario Residents by Initial Recipient

	Individual	Savings institutions	Chartered banks and non-financial corporations	Insurance companies	Total distribution to Ontario residents
(millions of dollars)					
Federal.....	142.6	22.0	60.4	15.8	240.8
Provincial.....	6.5	3.6	3.0	4.5	17.6
Municipal.....	4.5	2.4	1.5	4.5	12.9
Other provincial and municipal.....	5.7	3.1	6.0	4.7	19.5
	159.3	31.1	70.9	29.5	290.8

Source: This table is based on statistics provided in *Bank of Canada Statistical Summary Supplement*, 1962, pp. 60 and 100. The operations performed on these published data are described in Appendix B and in the above paragraphs.

Expenditures on Agriculture

Although a major federal outlay, only 1 per cent of the provincial expenditures is devoted to agriculture in Ontario, and the municipalities of the province do not directly aid this sector of the economy at all. The federal expenditures on agriculture are very diverse but can be grouped into four functional classes. One class is composed of administrative services, including conservation work. The second class encompasses the agricultural research activities of the government. The largest expenditure component in this class is the operation of experimental farm laboratories and research institutes. The total expenditure on these two classes is 20 per cent of federal expenditures on agriculture. The third class comprises expenditures on production and marketing services, which includes freight assistance on western feed grains, quality premiums on hog and lamb carcasses to encourage production of these animals, crop insurance, and lime assistance programs to improve soil. These expenditures equal 25 per cent of the total. Expenditures in the fourth and largest category are on the agricultural price support program and payments to western grain producers. This category accounts for 55 per cent of total agricultural expenditures. The Ontario expenditures on agriculture cover many different programs, including the maintenance of the various agricultural boards; experimental and research facilities located throughout the province, but primarily at Guelph; extension and inspection services.

We assume that the first two classes of federal expenditures and the provincial expenditures benefit all farm families equally. We reject the alternative that these benefits accrue to farmers in proportion to their incomes because many of the expenditures are general and yield indirect benefits to all farmers. In addition, the level of expenditure on these programs is not directly related to farm prices and farm income. We also reject the hypothesis that these expenditures are shifted forward to consumers, because the benefits are very widespread and do not appear to have a direct effect on production costs. In addition some farm products are sold at support prices which are relatively fixed.

The federal expenditure on items included in the last two classes is allocated to farm families in proportion to their incomes. Many of these programs are

intended to increase farm incomes, and deficiency payments are essentially transfer payments. In addition most of the benefits that farmers receive from these expenditures are related to the amount produced. Since the farmers who produce large quantities are also likely to be those with high incomes, our method of distributing these benefits in proportion to farm income is likely to give adequate results.

Social Welfare

This category of expenditures is almost entirely composed of programs that involve making transfer payments to families. These expenditures differ from most others in that the intent of many social welfare programs is to alter the distribution of income. The unemployment payments, old age security payments and government pensions are an attempt to redistribute income over time as well as at a given time. Family allowance payments and aid to the blind redistribute income only at a point in time. However, since our analysis is based only on 1961 we are concerned with the distribution of payments for that year.

We assume that the benefits of these transfer payments are not shifted from the initial recipients. Thus, contrary to most expenditure programs, the impact of these expenditures on the income of families is both direct and exact. We still are faced, however, with the difficulty of ascertaining the proportion of these expenditures that are paid to the families in each income class. In some cases we have a distributive series for an expenditure item and in other cases, the items are grouped together in a series called other transfer payments.

There are many different public welfare programs in this category. Table 4:5 indicates the amount of each expenditure that accrues to the residents of Ontario.

TABLE 4:5—Social Welfare Expenditures

	Provincial	Municipal	Ontario share of federal	Total
	(millions of dollars)			
Old age benefits.....	14.0	—	216.0	230.0
Government pensions.....	16.7	2.9	33.4	53.0
Family allowances.....	—	—	167.0	167.0
Benefits to labour.....	63.1	—	219.6	282.7
Veterans' benefits.....	—	—	125.4	125.4
Miscellaneous transfers.....	23.0	24.4	10.8	58.2
	116.8	27.3	772.2	916.3

Source: This table is based on the statistics presented in the government documents described in Appendix A, and the operations performed on these data are described in Appendix B.

Some of these expenditure items consist of two components. One component is the transfer payment made directly to families. The second component is a good or service provided the beneficiary, such as veterans' hospitals and the national employment service. The second component is treated in the same manner as most other government expenditures. It is allocated to families on a cost-occasioned basis. Since some of the items listed in Table 4:5 are a com-

posite of several expenditures, and because the methods of distributing some of the benefits are very arbitrary, we briefly explain our treatment of each expenditure.

Old age benefits include both the payments from the Old Age Security Fund and the payments made under the Old Age Assistance Program. The revenue for the Old Age Security Fund is obtained from the federal personal income, corporate income and sales taxes. In 1961 the proceeds from a 3 per cent tax on corporate income, 3 per cent tax on personal income up to a maximum of \$90, and a 3 per cent sales tax were paid into the Old Age Security Fund. In 1961 monthly payments of \$55.00 were paid from this Fund to all individuals over 70 years of age who had resided in Canada for at least ten years.¹² The Old Age Assistance Program is for those few individuals who are not eligible for the Old Age Security Fund payments and this plan is a joint federal-provincial program. The old age benefits are distributed to the recipients of the transfer payments.

Government pensions include payments by the three levels of government to retired employees. Since employee contributions are included in the analysis of government revenues, consistency demands we include the payments in the expenditure discussion. The percentage distribution used to allocate these payments is derived from a distribution of government pensions and annuities for all Canada.¹³ This Canadian distribution was adjusted to take account of the higher income in Ontario by the same procedure as was used to derive the distribution of expenditures on higher education.

Family allowances are payments made to families on behalf of every child under sixteen. These monthly payments are \$6.00 for each child under 10 years and \$8 for each child from 10 years to 15 years. Family allowances directly increase the income of families and thus these benefits are distributed to the families who receive them.

Benefits to labour include two types of federal expenditure that benefit workers. One is the Unemployment Insurance Program that provides for payments to the unemployed. The second expenditure encompasses services to labour. The most important item in this category is the National Employment Service, which brings employers and prospective employees (primarily unemployed) together as well as administering the Unemployment Insurance Program. The unemployment benefits are distributed to the recipients of them. The cost of operating the National Employment Service and other services to labour are allocated to workers. We recognize that businesses also benefit from some of these expenditures, but the programs are generally oriented toward aiding labour. Since these services exist to aid all workers, the expenditure on services to labour is distributed to all families equally. There are also some provincial expenditures that benefit labour. These expenditures include workmen's compensation payments, aid to the unemployed, industrial vacations, mediation services, and inspections to ensure safe working conditions.

Veterans' benefits. As with the labour benefits, there is both a transfer payment component and a service component in this category. The transfer component

includes war pensions for disabled veterans or payments to their dependants. Nearly all of the pension payments are for the veterans of the two world wars. World War I veterans receive approximately 35 per cent of the payments and World War II veterans the remainder. The service component includes medical and hospital care, life insurance for those who lost their insurability during service, and post-discharge benefits such as loans for homes, furniture and business working capital and vocational, technical and university training. The war pensions and veterans' allowances are distributed to the families who receive them. The service component provides a problem, however. These benefits accrue to veterans in nearly equal portions, and there are no available data that show the distribution of veterans among the various income classes. Thus we employ the following indirect method of distributing the cost of veterans' services.¹⁴ In this procedure we make two assumptions: (1) The veterans are in particular age groups, World War I over 65 and World War II 40-64; (2) the veterans are distributed among the income classes in the same manner as all individuals who are in the same age group. Then, using available data showing the percentage of individuals in these two age groups that are in each income class, the costs of veterans' services can be allocated to the various income classes.

Miscellaneous transfers. This group includes direct relief which is especially important at the municipal level, child welfare, mothers' allowances, aid to the blind, disabled persons' allowances and homemakers' and nurses' services. Expenditure on these items is distributed to the recipients of the transfer payments.

General Expenditures

There are general expenditure programs at all three levels of government, but they are the most significant at the federal level. Nearly 40 per cent of all federal expenditures are in this general category, whereas only 25 per cent of the provincial and 28 per cent of the municipal expenditures are classified as general. The major expenditure components placed in this category are defence and mutual aid, which includes contributions to the United Nations and aid to underdeveloped countries as well as defence expenditures; general government, which includes the cost of operating the legislative, judicial and executive branches of government; protection to persons and property, which encompasses all fire and police services; and some of the expenditure on natural resources. National defence is by far the largest item at the federal level, and protection to persons and property and general government are the dominant general expenditures for the provincial and municipal governments.

As we mentioned previously, these expenditures are placed in a general category because there is no obvious basis on which to distribute the cost of the programs to families. As holds true for most services provided by the government, individuals do not need to indicate the value they place on these general expenditures in order to enjoy the benefits from them. For general expenditures, there is the additional difficulty that there is no empirical evidence or accepted theory relating the use of these expenditure programs to income. Thus, as opposed to

the treatment of the specific expenditures, there is no obvious way in which to allocate these general expenditures among the income classes in proportion to the cost of providing the service to the families in each class.

Therefore, we are faced with making an arbitrary assumption as to the incidence of these general expenditures or to omit them from the analysis. Since they are such a large proportion of total government expenditure, we judge that it is better to distribute them on some "reasonable" basis than to omit them. This is because we are attempting to measure the total impact of government revenue expenditure programs on the distribution of income. Since, however, some may disagree with this point of view, we present many of our findings both including and excluding these general expenditures.

There are several hypotheses regarding the incidence of these expenditures that could be adopted. We restrict our discussion, however, to what we judge are the four most reasonable hypotheses. One hypothesis is that the cost of providing these services is equal for all individuals. This implies that expenditures on, for example, national defence and justice are available in equal amounts for each individual. The second hypothesis is a slight modification of the first: that these general services are supplied to each family in equal amounts. One argument in support of this hypothesis is that some programs, such as fire protection and the postal service, tend to be used on a family rather than individual basis. A third hypothesis is that families benefit from these expenditures in proportion to their income. This assumes that high income families have more to lose than those with low incomes and thus benefit more from such items as protection to persons and property and national defence. On the other hand, it can be argued, however, that high income families benefit less than low income families because they can afford to hire their own protection. A second argument for this third hypothesis is that some public expenditures such as health inspection of restaurants may benefit families in proportion to their expenditures and consequently be related to their incomes. A fourth hypothesis is that families consume these public services in proportion to their investment income. The rationale behind this hypothesis is that firms benefit initially from expenditures on items like justice, fire protection and national defence. These benefits then accrue to families in proportion to their ownership of the firms.

All of these hypotheses appear to have some validity, and no one of them is judged to be superior to the others. In presenting our data, we have two choices. One is to present four sets of results with each set based on one of the four hypotheses.¹⁵ The other choice is to average the results obtained from using the four hypotheses. The advantage of presenting results based on each hypothesis is that all general expenditures are treated in a consistent manner and the allocation procedure can be more easily defended on theoretical grounds. One disadvantage of this alternative is that not all of the general expenditures fit into any one category and further, that examples of expenditures that appear to fit into each category can be found. Thus, the averaging procedure may give estimates that are closer to the "true" distribution than those obtained by employing any one hypothesis. In addition, the number of computations is much smaller if only one hypothesis is used. Thus, we adopted the second alternative which involves dis-

tributing general expenditures utilizing all four hypotheses in one measure. Since we do not have any information with which to take a weighted average we arbitrarily distribute one-fourth of the expenditures among the income classes in proportion to the number of individuals in each class, one-fourth in proportion to the number of families, one-fourth in proportion to income (adjusted personal income) and one-fourth in proportion to dividend income. The four percentage distributions are presented, however, so that any combination of the four hypotheses can be adopted.¹⁶ In allocating the general expenditures, we assume that non-residents receive benefits only through their ownership of firms.

EMPIRICAL RESULTS OF EXPENDITURE ANALYSIS

In presenting the results of our study regarding the incidence of government expenditures, we follow the same format that we used in describing the tax results. In addition to the qualifications given to the tax results, two points should be discussed here. One point involves using the concept of an average expenditure rate in each class. The amount of expenditure received by families in each class is likely to vary more than the amount of taxes paid. This is because families who are in a given class receive nearly the same amount of income and make expenditures of roughly the same magnitude. Thus each family pays approximately the same amount of consumption taxes. The amount of income tax paid by families in each class varies more than do consumption taxes. However, the variation is not as great as for the government expenditures received because nearly every family pays some income tax and all families have some deductions and exemptions. Families in each income bracket do not, however, receive anything like the same amount of government expenditure. A family receives very little government interest unless it holds bonds or stock. No benefits are received from expenditures on family allowances and education unless there are children in the family. The amount of other transfer payments received by families in each bracket is also likely to fall with uneven incidence. A second point, which was mentioned previously, is that we do not take account of any benefits that may accrue to other than the direct recipients of such items as education, protection to persons and property, and health expenditures. Nor do we allow for the possibility that one family may benefit more from an expenditure than another even though the cost assigned to each is the same. Thus it may be that the distribution of actual benefits received from a particular government program is different from the distribution of the cost involved in providing the service.

The results we obtain by distributing government expenditures among the seven income classes and the non-resident category are presented in Table 4:6. The bases for the distributions are the incidence assumptions discussed in the previous pages. As with taxes, the values given in the seven income classes merely form part of the basic data for Table 4:7, but the expenditure accruing to non-residents merits comment. According to our analysis, non-residents receive a much smaller proportion of provincial and municipal expenditures than of the Ontario revenue burden. Non-residents pay 27 per cent of the revenue received by the Ontario provincial and municipal governments but only receive 13 per cent of the

TABLE 4:6—Distribution of Expenditures, 1961

	Under \$2,000	\$2,000– 2,999	Family money income class				\$10,000 and over	Total benefit to Ontario residents	Benefit to non-residents	Total
			\$3,000– 3,999	\$4,000– 4,999	\$5,000– 6,999	\$7,000– 9,999				
						(thousands of dollars)			%	
Provincial Expenditures	6,964	9,001	14,613	26,350	54,352	39,307	23,413	174,000	72,200 (29)	246,200
Highways, roads and bridges.....	9,232	16,806	28,661	52,929	83,429	51,483	28,460	271,000	—	271,000
Education.....	21,958	19,063	25,580	41,166	66,677	39,376	14,580	228,400	—	228,400
Health and sanitation.....	1,564	1,110	1,166	1,677	3,919	3,658	4,506	17,600	31,800 (64)	49,400
Interest.....	25,794	18,723	12,009	14,256	21,822	17,463	6,733	116,800	—	116,800
Social welfare.....	3,962	1,805	1,291	855	903	418	266	9,500	—	9,500
Agriculture.....	10,735	8,927	11,312	17,369	30,321	21,548	18,388	118,600	23,900 (17)	142,500
General expenditures.....	80,209	75,435	94,632	154,602	261,423	173,253	96,346	935,900	127,900 (12)	1,063,800
Municipal Expenditures	4,610	5,274	8,263	14,505	29,386	21,256	13,806	196,500	37,700 (28)	134,200
Highways, roads and bridges.....	11,339	22,334	39,858	74,218	110,983	63,222	21,646	343,600	—	343,600
Education.....	14,434	10,660	12,510	17,876	30,761	20,050	8,309	114,600	24,500 (18)	139,100
Health and sanitation.....	1,075	782	886	1,291	3,039	2,802	3,025	12,900	27,300 (68)	40,200
Interest.....	5,744	5,035	2,980	3,590	5,003	3,804	544	27,300	—	27,300
Social welfare.....	20,858	17,306	21,878	33,638	58,475	41,750	35,595	229,500	44,900 (16)	274,400
General expenditures.....	58,060	61,391	86,375	145,118	237,647	152,884	82,925	824,400	134,400 (14)	958,800
Total.....	138,269	136,826	181,007	299,720	499,070	326,137	179,271	1,760,300	262,300 (13)	2,022,600
Total Provincial and Municipal Expenditures	1,598	1,878	2,989	5,259	10,709	7,794	4,673	34,900	54,100	89,000
Federal Expenditures	5,224	5,472	8,398	11,059	23,148	17,818	9,281	80,400	224,600	305,000
Other transportation.....	1,303	2,018	3,072	5,545	9,995	7,268	6,799	36,000	57,000	93,000
Education.....	12,424	10,529	14,013	22,408	36,511	21,458	7,957	125,300	240,700	366,000
Health and sanitation.....	24,856	16,620	14,966	21,047	48,765	46,564	67,982	240,800	412,600	653,400
Interest.....	188,141	104,100	14,322	96,610	159,927	107,972	41,128	772,200	1,493,800	2,266,000
Social welfare.....	8,470	19,782	19,536	16,454	22,053	14,293	17,512	118,100	176,900	295,000
Agriculture.....	76,438	67,139	83,513	125,833	220,727	164,377	207,878	945,700	1,732,700	2,678,400
General expenditures.....	318,454	227,538	220,809	304,215	531,830	387,544	363,010	2,353,400	4,392,400	6,745,800
Other Provincial and Municipal Expenditures	1,933	2,208	3,458	5,736	11,536	8,818	6,111	39,800	—	—
Highways, roads, bridges and other transportation.....	403	390	605	968	1,904	1,463	767	6,500	—	—
Health and sanitation.....	1,475	1,154	1,241	1,730	3,936	3,752	6,212	19,500	—	—
Interest.....	1,788	2,710	2,657	2,820	4,724	5,866	35,335	55,900	—	—
General expenditures.....	5,599	6,462	7,961	11,254	22,100	19,899	48,425	121,700	—	—
Total Expenditures for All Levels of Government.....	462,322	370,826	409,777	615,189	1,053,000	733,580	590,706	4,235,400	—	—

Source: Table 4:1 and Appendix B.

TABLE 4:7—Effective Expenditure Rates for Total Government Expenditures, 1961

	Under \$2,000	\$2,000– 2,999	\$3,000– 3,999	\$4,000– 4,999	\$5,000– 6,999	\$7,000– 9,999	\$10,000 and over	Average expenditure rate
	(percentage of income)							
Provincial Expenditures								
Highways, roads and bridges.....	1.2	1.2	1.5	1.6	1.8	1.6	1.2	1.5
Education.....	1.7	2.2	2.9	3.3	2.7	2.0	1.5	2.4
Health and sanitation.....	4.0	2.5	2.6	2.5	2.2	1.6	.8	2.0
Interest.....	.3	.1	.1	.1	.7	.1	.2	.2
Social welfare.....	4.6	2.4	1.2	.9	.7	.7	.4	1.0
Agriculture.....	.7	.2	.1	.1	—	—	—	.1
General expenditures.....	1.9	1.2	1.2	1.1	1.0	.9	1.0	1.0
Total.....	14.4	9.8	9.6	9.6	8.5	6.9	5.1	8.2
Municipal Expenditures								
Highways, roads and bridges.....	.8	.7	.8	.9	.9	.8	.7	.8
Education.....	2.1	2.9	4.1	4.6	3.6	2.5	1.1	3.0
Health and sanitation.....	2.6	1.4	1.3	1.1	1.0	.8	.4	1.0
Interest.....	.2	.1	.1	.1	.1	.1	.2	.1
Social welfare.....	1.0	.6	.3	.2	.2	.2	.1	.2
General expenditures.....	3.8	2.3	2.2	2.1	1.9	1.7	1.9	2.0
Total.....	10.5	8.0	8.8	9.0	7.7	6.1	4.4	7.1
Total Provincial and Municipal Expenditures.....	24.9	17.8	18.4	18.6	16.2	13.0	9.5	15.3
Federal Expenditures								
Highways, roads and bridges.....	.3	.2	.3	.3	.3	.3	.2	.3
Other transportation.....	1.0	.7	.9	.7	.7	.7	.5	.7
Education.....	.2	.3	.3	.4	.3	.3	.4	.3
Health and sanitation.....	2.2	1.4	1.4	1.4	1.2	.8	.4	1.1
Interest.....	4.5	2.2	1.5	1.3	1.6	1.8	3.6	2.1
Social welfare.....	33.8	13.5	7.5	6.0	5.2	4.3	2.2	6.6
Agriculture.....	1.5	2.6	2.0	1.0	.7	.6	.9	1.0
General expenditures.....	13.7	8.7	8.5	7.8	7.2	6.5	10.9	8.2
Total.....	57.2	29.6	22.4	18.9	17.2	15.3	19.1	20.3
Other Provincial and Municipal Expenditures.....	1.0	.8	.8	.7	.7	.8	2.5	1.1
Total Expenditures for All Levels of Government ...	83.1	48.2	41.6	38.2	34.1	29.1	31.1	36.7

Source: Tables 2:1 and 4:6.

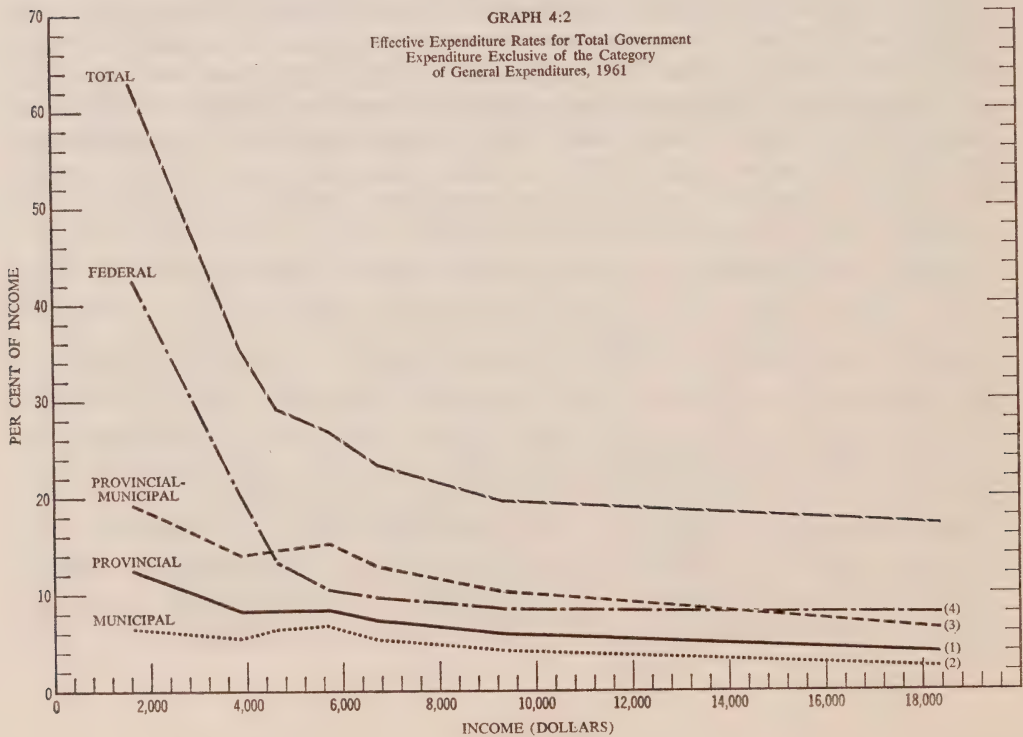
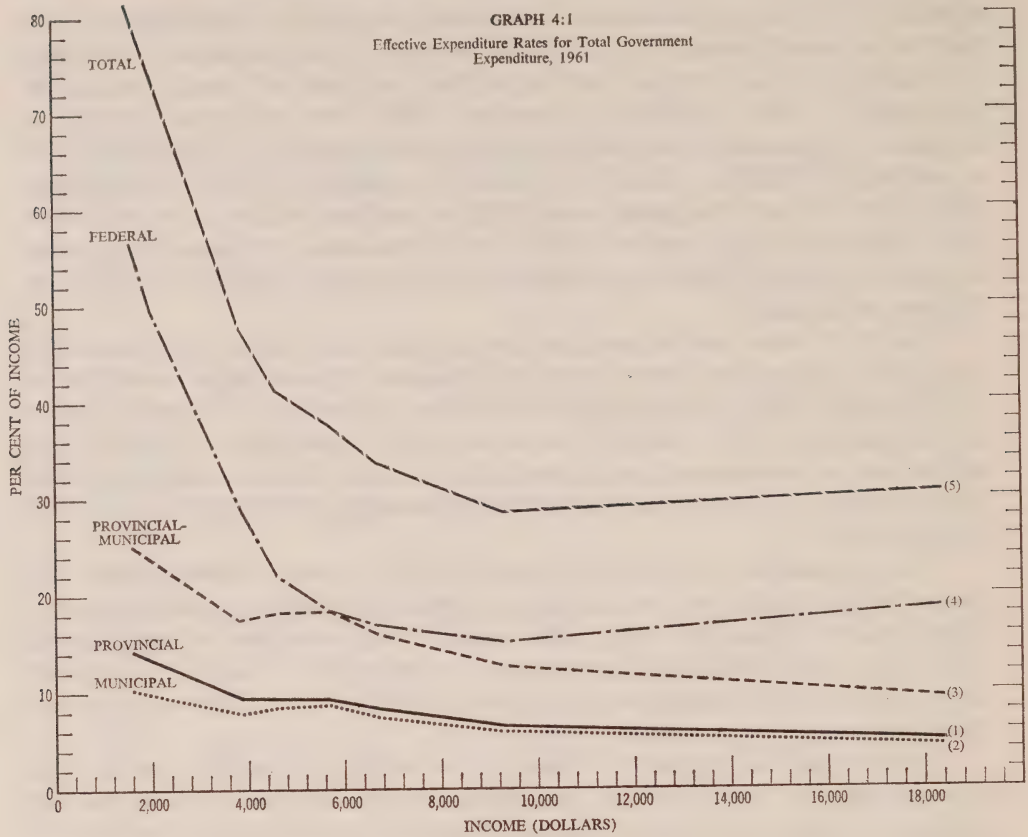
expenditures by these governments. The benefit exported to non-residents is less than the exported revenue burden, partly because of our assumption regarding the incidence of each revenue and expenditure program and partly because of the nature of many expenditure programs. With few exceptions, the direct recipients of expenditures on social welfare, health measures and education must be residents of Ontario. Since it is difficult to conceive of these benefits being shifted from the initial recipients, none of the expenditures accrue to non-residents. It is also very likely, however, that Ontario residents pay more than twice as much in taxes to foreign governments as they receive from the expenditures of these governments.¹⁷

For the Province and its municipalities, it is only the interest, road, sanitation, and general expenditures that benefit non-residents. Non-residents receive interest by holding Ontario debt directly and through ownership of Canadian banks and corporations. They benefit from some of the expenditure on highways as tourists and as consumers of goods produced in Ontario. General expenditures add to the incomes of non-residents through their ownership of corporations operating in the province.

The expenditures received by families in the various income classes are divided by the total income in each class to obtain the effective expenditure rates. These effective expenditure rates which indicate the proportion of total income that results from government expenditures are presented in Table 4:7. Similar to the treatment of revenues, we present the material given in Table 4:7 through the use of five graphs, numbered 4:1-5.

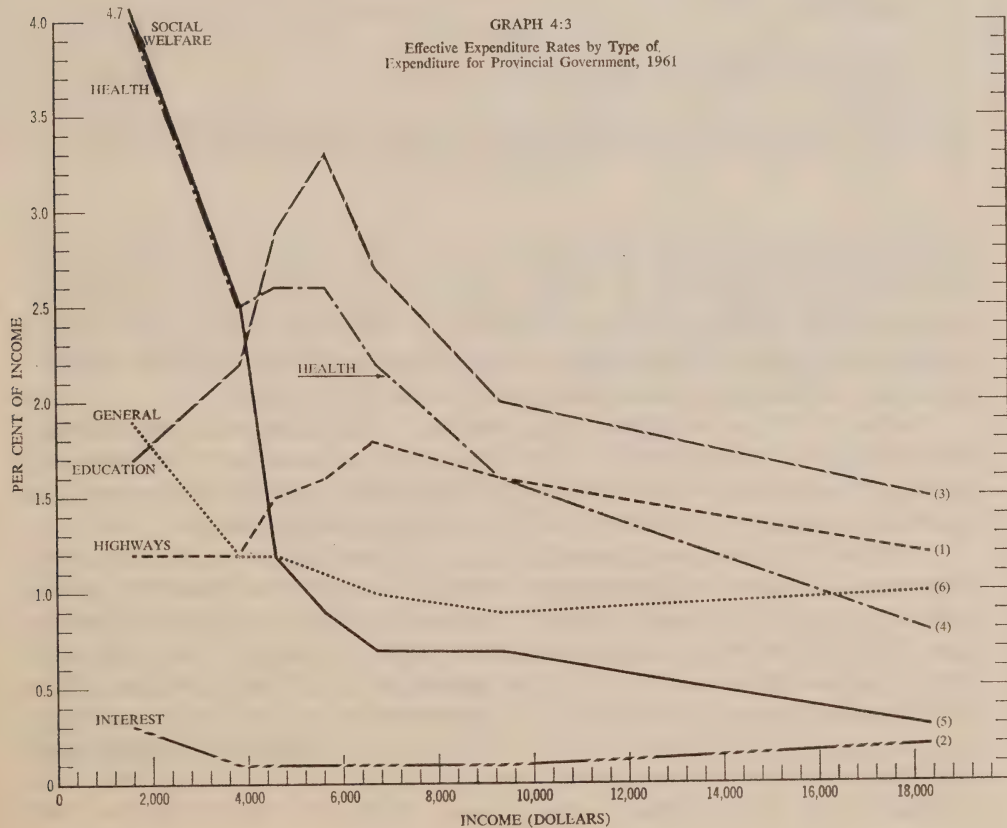
In the first two graphs, we illustrate the benefit pattern that results from the expenditure of each level of government. All government expenditures are included in Graph 4:1, and all except the general expenditures are included in Graph 4:2. As is indicated in both graphs, the benefit pattern of expenditures is progressive at all levels of government. The omission of general expenditures from the analysis tends to reduce the progressivity of the expenditures over the first six income classes and increase the progressivity from the \$7,000-\$9,999 income class to the \$10,000 and over class. The provincial expenditures are progressive throughout the income scale, and the expenditure rates range from 14.4 per cent in the lowest category to 5.1 per cent in the highest class. When we omit the general category, these percentages decrease to 12.5 per cent and 4.1 per cent respectively. The municipal expenditures are also progressive over the entire income scale. The effective rates for the lowest and the highest income classes are 10.5 per cent and 4.4 per cent including all expenditures, and 6.7 per cent and 2.5 per cent respectively for all expenditures except the general category. The federal expenditures are progressive over all incomes when the general expenditure category is omitted but are progressive only up to the highest income class when all expenditures are included. When general expenditures are not included, the rates range from 43.5 per cent to 8.2 per cent. When all expenditures are included, the rate for the lowest category is 57.2 per cent, for the \$7,000-\$9,999 category, 15.3 per cent, and 19.9 per cent in the \$10,000 and over category. The most progressive federal expenditure is public welfare. This progressivity is very pronounced in moving from the under \$2,000 class to the next class, where the rate falls from 33.8

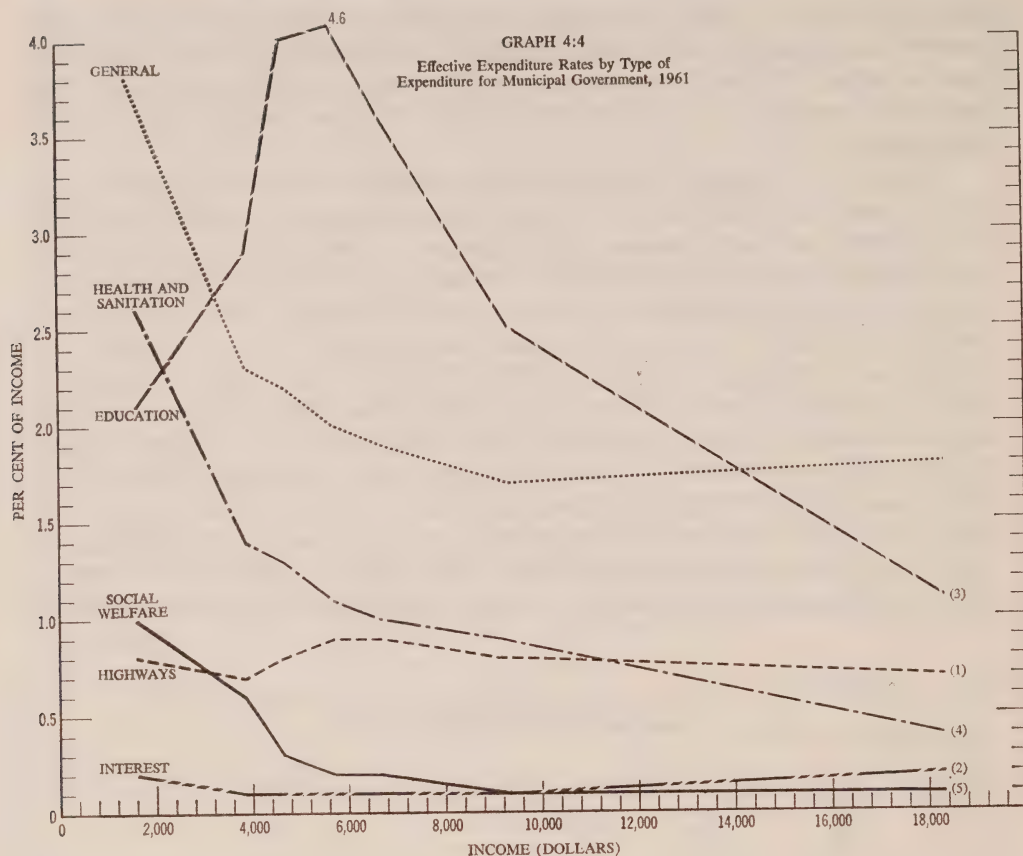
THE INCIDENCE OF GOVERNMENT REVENUES AND EXPENDITURES



per cent to 13.5 per cent. The health and sanitation expenditures are also progressive throughout the entire income range, but the pattern of the other expenditures is mixed. Although not shown on the graph, the other provincial and municipal expenditures are distributed in nearly the same pattern as the federal expenditures.

Graph 4:3 illustrates the pattern of expenditure rates for the major provincial items. The distribution of highway benefits presents a mixed picture that is progressive over some incomes and regressive for other income ranges. This mixed effect is due to the fact that the benefits received by the owners of private passenger vehicles are distributed regressively and the benefits initially accruing to commercial vehicle owners are distributed progressively. Interest payments are proportional to income, except for the \$10,000 and over class where they form a higher percentage of income than for the other classes. Education expenditures form an inverted U-shaped distribution. The explanation for this distribution is that the number of children per family increases faster than family income in the first income classes but increases slower than income in the highest income categories. The health and sanitation expenditures are progressive because we assume that many of the health programs benefit each family or each person equally, regardless of income. As is true for all levels of government, the pattern of public

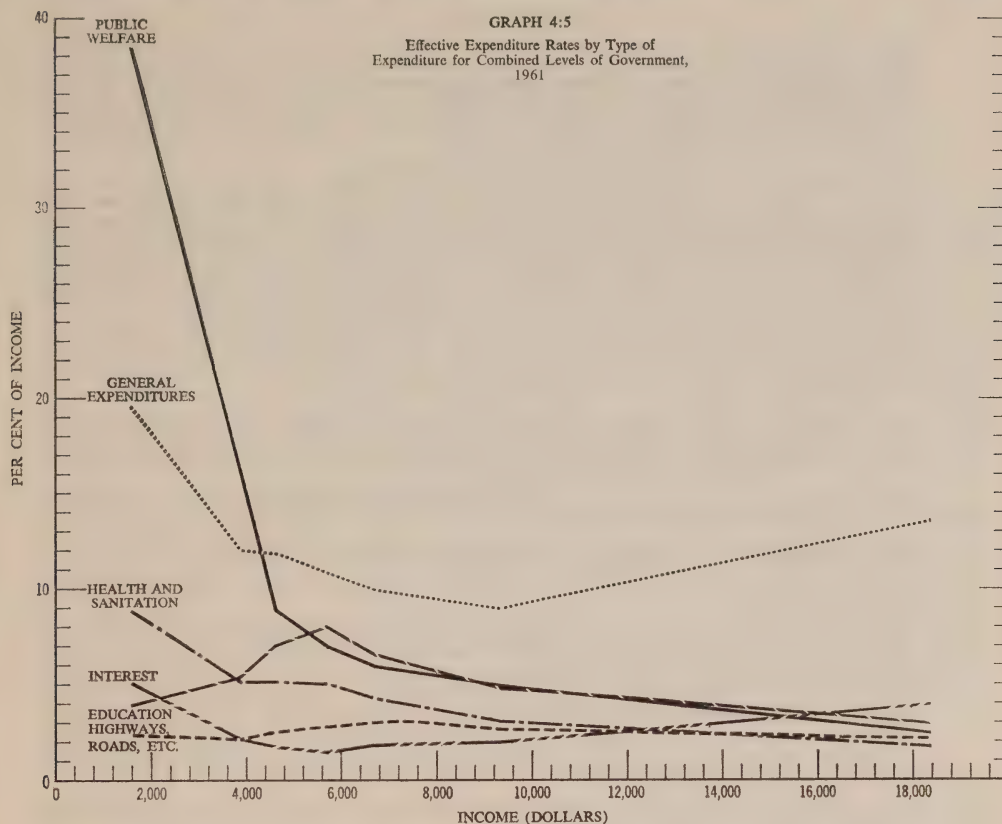




welfare expenditures at the provincial level is very progressive. The general expenditures are progressive up to the highest income class when they become regressive. The portion distributed according to income is nearly proportional, the parts distributed by families and individuals are progressive, and the remaining portion, which is distributed by divided income, is regressive.

In Graph 4:4, we show the benefit patterns of the major municipal expenditures. The items included in this graph are nearly the same as those discussed at the provincial level. The patterns of effective rates are also similar to those derived for provincial expenditures and do not merit special attention.

In Graph 4:5, we group items by type of expenditure rather than by level of government. The expenditure categories selected are interest; education; public welfare; health and sanitation; highways, roads and bridges; and general expenditures. The distribution of interest payments is slightly U shaped. The downward-sloping portion of the curve reflects the pattern of liquid asset holdings. The upward-sloping portion results from the concentration of bank and corporation stock among the high income families. The pattern of benefits resulting from education expenditures is regressive over the first half of the income scale and progressive over the remaining income classes. This again reflects the fact that



the number of school-age children rises faster than income up to incomes of \$5,000 and then the ratio of school-age children to income falls over the rest of the income scale. Although the expenditures on both higher education and secondary and primary education are distributed in the shape of an inverted U, the variation in expenditure rates for higher education is much less than for the secondary and primary categories. Public welfare expenditures are the most progressive of all expenditures. The average expenditure rate is 39.4 per cent for a family in the lowest income bracket and 2.7 per cent for a family in the \$10,000 and over class. Except for family allowance payments, which are distributed in a manner similar to education, all of the transfer payments are **very** progressive. Health and sanitation expenditures are progressive throughout the income scale and the pattern of effective rates has nearly the same shape as the provincial health expenditures. The total road and general expenditures are also distributed in the same way as the provincial expenditures. The pattern of road expenditures is mixed but is progressive over the last three income classes. The general expenditures are progressive up to the last income bracket when they become extremely regressive.

FOOTNOTES

- ¹There are numerous studies in which the incidence of taxation by income class has been estimated but there are fewer in which the distribution of expenditures has also been investigated. One reason expenditures have received less attention than revenues is that it is more difficult to allocate expenditures by income class, and consequently the results are less reliable than for revenues.
- ²This method of distribution is equivalent to distributing costs on an average cost basis. It should be noted that this method is used to distribute costs because of lack of information on the benefits received by each family and, in addition, we are concerned with distributing the existing costs of government programs, not in determining the optimal level of each program. Thus, the use of the cost-occasioned method here should not be viewed as an endorsement of the policy of charging individuals for government-produced goods and services on an average cost basis.
- ³*Financial Statistics of Municipal Governments, 1961; Financial Statistics of Provincial Governments, 1961; Financial Statistics of the Government of Canada, 1961.*
- ⁴The improvements portion of business and farm assessment.
- ⁵The portion of road expenditure allocated to users is treated as a negative gasoline tax. Since the incidence of the gasoline tax is discussed at some length in the previous chapter, we do not repeat the analysis here.
- ⁶87th Congress, 1st Session, House Document No. 120, *Final Report of the Highway Cost Allocation Study* (Washington, D. C.: U.S. Government Printing Office, 1961).
- ⁷This information was supplied by the Ontario Department of Transport. The user portion is the sum of the proportions allocated to the owners of passenger and commercial vehicles.
- ⁸The estimate of 28 per cent (the proportion of expenditures initially accruing to families that is enjoyed by foreigners) is based on materials supplied by the Ontario Department of Travel Research, and the 31 per cent (the proportion of the expenditures initially allocated to Canadian families that is enjoyed by Ontario families) is based on data collected by the Dominion Bureau of Statistics: *Urban Family Expenditure 1959*, Table 3. This study shows that an Ontario family spent a smaller proportion of its total expenditure on air, water and rail transportation than the average Canadian family.
- ⁹Dominion Bureau of Statistics, *University Student Expenditure and Income in Canada 1956-57* (Ottawa: Queen's Printer, 1959).
- ¹⁰W. I. Gillespie, *The Incidence of Taxes and Public Expenditures in the Canadian Economy*, Draft Report for the Royal Commission on Taxation, p. 97. More specifically, Mr. Gillespie's assumption is that the ratio of families of students attending college to total families in each class was the same in 1961 as it was in 1957.
- ¹¹These percentages in this section of our study are taken from *Bank of Canada Statistical Summary Supplement*, 1962, pp. 60 and 100. There are no data regarding the distribution of the Ontario provincial and municipal debt by type of owner. Thus all the calculations on the Ontario debt are based on data for all Canadian provinces and municipalities.
- ¹²The monthly payments were increased to \$65 in February 1962.
- ¹³Dominion Bureau of Statistics, *Incomes, Liquid Assets and Indebtedness of Non-Farm Families in Canada, 1958* (Ottawa: Queen's Printer, 1960).
- ¹⁴This procedure was developed by Professor W. I. Gillespie in his study for the Royal Commission on Taxation.
- ¹⁵This is the commonly accepted procedure. Musgrave and Daicoff in their Michigan study and Gillespie in his Canadian study adopted this procedure.
- ¹⁶All percentage distributions are presented in Appendix B. The interested reader can redistribute the general expenditures according to the assumption of his choice, by multiplying the total general expenditures by the percentage distribution corresponding to the assumption that is adopted.
- ¹⁷As mentioned in Chapter 1, the revenues and expenditures of foreign governments that accrue to Ontario residents are not included in our study. So the total revenue and expenditures imported into the province cannot be determined. However, the amount of revenue paid by Ontario residents to the other provinces and their municipalities was slightly more than twice the expenditures received from these governments.

CHAPTER 5

Net Fiscal Incidence

IN THIS chapter we examine the total impact of government revenue and expenditure programs on the Ontario income distribution. To make this examination, we utilize the results derived in the preceding two chapters.

Before presenting the results of our investigation regarding the net fiscal incidence of government, we want to reiterate some of the general shortcomings of the analysis as well as discuss one difficulty that relates specifically to the measurement of net fiscal incidence. Although many of these problems are discussed elsewhere in the study, we want to make certain that the reader is aware of the major statistical and theoretical problems.

First, in terms of the scope of our analysis, we do not investigate the total impact of government on the distribution of income, but only the changes in income that are caused by the government expenditure and revenue programs. We neglect any changes in income that, for example, are directly due to government policy on combines, international trade, and the level of the minimum wage. We also exclude the taxes and expenditure programs of foreign governments from our analysis even though we do take account of the Canadian revenue and expenditures that are exported to foreigners.

Second, both the basic data and our statistical techniques are unlikely to be entirely free from error. Much of the data used to allocate the revenues and expenditures are based on surveys. The basic surveys were taken for total Canada. In using the data that apply only to Ontario, the sampling and non-sampling errors inherent in the initial survey results are magnified. In addition, some of these survey results also are based only on the urban population, but in using the data we implicitly assume that the results apply to the rural population as well. A portion of the data on personal expenditure also is only available for 1959. In bringing the survey results forward to 1961, we implicitly assume that income is the only determinant of expenditure. In addition, we combine data from different sources and for both fiscal and calendar years. Last, we estimate some distributions, such as veterans' services and education benefits, on the basis of age.

Third, the revenue and expenditure incidence theory is not sufficiently developed that there is unanimous agreement on the incidence of each expenditure and revenue. There is a range from nearly unanimous agreement on the personal income tax to widespread disagreement between two points of view on the corporation income tax to virtually no agreement or controversy on the incidence of national defence expenditures. Since there is no conclusive empirical evidence for most of these incidence theories, many of which are based on the assumption that the economy is very competitive, we are forced to make an arbitrary assumption about the incidence of revenues and expenditures. However, since there is no one "right" answer in many cases and because some

will no doubt disagree with at least a portion of our assumptions, we have presented our results in a manner that allows an interested reader to implement other assumptions. The use of other incidence assumptions would not likely alter the revenue and expenditure patterns significantly. For example, the burden distribution of commodity taxes differs very little whether the assumption of forward shifting to consumers or backward shifting to factor incomes is employed. Except for the highest income class, the pattern of the corporation tax is similar for both the forward-shifting and zero-shifting assumptions.

Fourth, there is a problem of defining the proper income against which to measure the impact of government fiscal activity. Although we judge that the post-government income concept (explained in Chapter 2) is superior to other income definitions, it is not free from criticism. When examined in the context of what families view as their income, this post-government concept is somewhat artificial. If some of the imputed elements and adjustments to income like investment income of life insurance companies, retained earnings and the unshifted portion of the corporation income tax were actually paid to families, the level and pattern of consumption would change. Consequently, both the total and the distribution of many taxes, like the sales and excise levies, would also change. The same is true of adjusting income for revenues and expenditures. If, for example, families viewed expenditures on education as additions to their income, they might possibly alter their expenditures.

We recognize that some readers may prefer an alternative definition of income and we present the data with which to construct various income concepts in Table 2:1. The use of different income concepts changes both the level and the distribution of tax and expenditure rates, but the chief effect is to change the level rather than the distribution. All income concepts discussed previously in this study yield the same general conclusions on the progressivity and regressivity of the various taxes and expenditures. To the extent that the pattern of rates changes, however, all of the other income concepts tend to reduce the progressivity of the progressive taxes and the regressivity of the regressive taxes increase. The use of the other income definitions also results in generally higher rates with the rates in the lowest income bracket often exceeding 100 per cent. In comparing the results obtained by using each of the five definitions of income, the greatest difference between the tax and expenditure rates occurs when the pre-government and post-government concepts are employed. Since our emphasis is on the redistribution of income among classes rather than the level of the redistribution, our general findings are valid for all the five definitions of income.

Fifth, as mentioned in the chapter on expenditures, the expenditure rates and consequently the net fiscal incidence rates should be accepted with caution. These rates are averages that are computed by dividing total expenditure and total expenditure less taxes by the total income in each class. Although the amount of revenue paid by each family in a class is likely close to the computed average, the same does not hold for expenditures. The incidence of expenditures within a class is likely to be very uneven owing to the number, age and characteristics of family members. For example, a family that is headed by a disabled veteran and encom-

passes many school-age children and members who need a great amount of medical care no doubt receives more government expenditures than other families with the same income.

Our results also only indicate the redistribution of income from families in one income class to families in another class. No reference is made to the redistribution of income among families in the same class. The amount of this redistribution resulting from the fiscal activity of government is no doubt substantial. However, we do not have sufficient data with which to estimate this redistribution of income within classes.

Sixth, our study is for the year 1961. Since that time there have been many changes in the government expenditure and revenue programs. There have been changes in tax rates, intergovernmental agreements and the amount of money allocated to each expenditure item. In addition, there have been new expenditure and revenue programs introduced since 1961. These changes have some impact on our results both in changing the over-all level of revenues and expenditures and in the distribution of revenues and expenditures among levels of government. However, we do not believe that these changes would significantly affect the patterns of effective expenditure and revenue rates that we developed in the preceding chapters.

In addition to these shortcomings which are applicable to nearly all parts of our analysis, there is a particular problem that arises in measuring net fiscal incidence. This problem is the proper treatment of the deficit that occurs because the government expenditure allocated to Ontario families is greater than the revenue allocated to them. From the results presented in Tables 3:3 and 4:6 it appears that Ontario residents gain approximately \$480 million as a result of the fiscal activity of Canadian governments. At the federal level, the gain is nearly \$170 million. The benefits of Ontario provincial expenditures exceed the burdens of the revenues by \$150 million and the municipal expenditures are greater than the revenues by \$320 million. Ontario residents do, however, pay nearly \$160 million more to other provincial and municipal governments than they receive in benefits.

The treatment of the deficit is difficult and complex for at least three reasons. First, the deficit gives the impression that the total level of income—and, implicitly, economic welfare—has increased as a result of government revenue and expenditure programs. Although government deficits may stimulate economic activity and increase the total level of income over time, the purpose of our analysis is only to measure the redistributive effects of government at a point of time. Thus, in examining the effects of government revenue and expenditure programs on the distribution of income, we implicitly assume that the total amount of income remains constant and the government merely re-allocates a portion of it among families.

Second, the total deficit is the sum of two components. One component is the deficit that arises because government expenditures exceeded revenues at all three levels in 1961. The federal government ran a deficit that exceeded \$850 million, the Ontario provincial government spent nearly the same amount as it received, and the Ontario municipal governments had a deficit of approximately

\$260 million.¹ One reason for the size of municipal deficit is that municipalities receive unconditional grants from higher levels of government. When these grants are spent, they are counted as municipal expenditures. The second component of the deficit is a consequence of exporting more of the revenue burden than of expenditure benefits to non-residents. After taking account of the revenues and expenditures of other provincial and municipal governments accruing to Ontario, non-residents paid approximately \$50 million more than they received from the Ontario governments in 1961. If the provincial and municipal governments had followed a balanced-budget policy, the difference between the amounts received and paid by non-residents would have been even larger.

Third, the deficit presents a problem because it is not uniformly spread over all levels of government. As stated earlier, the deficit at the federal level is \$170 million, for the Province \$150 million, and \$320 million at the municipal level. Since the deficit is not proportionately the same at all levels of government, any treatment accorded it has a different impact on the net fiscal incidence of each government. For example, if we eliminated the effects of the deficit by reducing expenditures at each level of government to the revenue total, the municipal expenditures would be reduced proportionately more than the provincial and federal expenditures.

Before explaining our treatment of the deficit, we examine the two deficit components in order to indicate their similarities and differences. As mentioned above, one part of the deficit can be explained by government spending more than it receives. This deficit complicates the analysis because it may affect the distribution as well as the level of income. Even if it can be assumed that the deficit does not affect the income distribution, there remains the problem of the increased level. This is because some assumption has to be made about the impact of the deficit on the price level. For example, it could be argued that the deficit increases the price level in the same proportion as it increases income. In this case the additional income arising from government fiscal activity is illusory rather than real. Thus, it would be misleading to indicate that the deficit increases the real income of families. Alternatively, the price level may remain unchanged if there is a deficit incurred. Even in this case, however, it could be argued that it is incorrect to indicate an increase in real income because a deficit is a liability that must be paid in the future.

As stated previously, the second component of the deficit exists primarily because non-residents pay more in revenue to the Ontario governments than they receive in expenditures. This deficit differs from the first component in several ways. First, although it may be government policy to spend more than it receives in an effort to reach some desired goal such as full employment or a faster rate of economic growth, it is not likely that government attempts to create this second deficit. It appears to be only an incidental effect of government policy. Second, in the case of the first deficit component, residents receive more public services than they currently pay for but at the expense of creating additional public debt. For the second component, the difference between expenditures and revenues is covered by payments made by non-residents. Third, this deficit

would be much less and might even turn into a surplus if the foreign taxes and expenditures accruing to Ontario residents were taken into account.

Although there are many differences between the two components, the economic effects of non-residents paying more than they receive are similar to those resulting from a deficit of a conventional nature. Under our incidence assumptions, non-residents pay taxes and receive expenditures, for the most part, either through ownership of Ontario businesses or through the consumption of goods produced in the province. If the revenues and expenditures associated with income were not borne by non-residents it is likely that they would receive an additional amount of income approximating the deficit. Although they would lose the expenditures distributed according to investment income, they would gain the taxes assumed to be levied on investment income. Thus, on net balance, they would gain if the deficit were removed. Non-resident consumers would also gain if the deficit were eliminated because they would pay lower prices. This means that the difference between revenues and expenditures accruing to non-residents is borne by them. Thus, the public services financed from this difference between the revenues and expenditures borne by non-residents has roughly the same effect on the economy as the services paid from the deficit caused by expenditures exceeding taxes.² Just as for the first deficit component, it is impossible to determine how the benefits or burden of this deficit should be distributed among families. Thus, we treat this deficit component in the same manner as the first component. And, since we treat both deficit components in the same manner, we can refer to a single deficit in the remainder of our discussion.

There are many assumptions that could be employed in treating the deficit, and in computing the net fiscal incidence of government. Four of the most plausible assumptions are as follows:

- (1) Assume that the deficit does increase the level of income and use the results of Tables 3:3 and 4:6 without adjusting them;
- (2) Assume that the price level increases in the same proportion as the deficit increases income and deflate the post-government incomes given in Table 2:1 by this price index. This manipulation affects only the level but not the pattern of effective rates;
- (3) Assume that the deficit does not increase real income and adjust some or all of the expenditure rates downward to eliminate the deficit;
- (4) Assume that the deficit does not increase real income and adjust some or all of the revenue rates upward to eliminate the deficit.

The best assumption to adopt depends on one's judgment as to what would have occurred in the absence of a deficit. If it is judged that a deficit does not increase the level of income, there is the further question of which is the best alternative for removing the deficit. Although far from satisfied with our solution, we compute the incidence of government fiscal activity utilizing both number (1) and (4) above.

We employ number (1) for several reasons. First, it does indicate the results of the investigation regarding the incidence of expenditures and revenues. Second, the economy was somewhat depressed in 1961, and it is unlikely that the deficit caused prices to change from what they would have been if government expendi-

tures and receipts had been equal. Third, there appears to be no treatment of the deficit that is obviously superior to this one. Any adjustment to the data that eliminates the effect of the deficit is arbitrary and may distort the pattern of incidence.

We also employ two variations of alternative (4), which is to adjust the revenue rates upward so that the expenditures and hypothetical revenues are equal. Although we judge alternative (1) to be superior to any other for 1961, there are some years when a deficit would cause an increase in prices. We select alternative (4) over (2) because we are concerned with the relationship between expenditures and revenues rather than with indicating the level of real income. Alternative (4) is chosen over (3) because, to the extent that governments attempt to balance budgets, they will likely raise taxes to meet expenditures rather than vice versa. This still leaves several assumptions that could be used to adjust tax rates. For example, it could be assumed that rates are increased in proportion to income or that the total revenue comes from one type of tax or that all revenues are increased in the same proportion. We adopt the assumption that all revenues are raised in the same proportion because we judge that economic variables such as production, consumption and government expenditures, to name a few, would be less likely to change as a result of a proportional increase in all taxes than if the same amount of revenue is raised by increasing any one tax, and thus our assumption that government fiscal activity does not greatly change these variables will be harmed less.

EMPIRICAL RESULTS OF NET FISCAL INCIDENCE INVESTIGATION

Now that we have explained the statistical and theoretical shortcomings of our investigation, we proceed with the presentation of our findings. It is here that we answer the question: "What is the impact of government fiscal activity on the income distribution of Ontario families?" As we did for revenues and expenditures, we use the technique of average rates of income to illustrate our findings. These average rates are compiled by taking the ratio of the income that is gained or lost by families in each class due to expenditure and revenue programs, to total income in the class. Since revenue programs reduce income and expenditures add to it, we subtract revenues from expenditures in measuring net fiscal incidence. Thus, a positive rate of net fiscal incidence means that the effect of government fiscal activity is to increase family income in that income class and a negative rate indicates a reduction in income. As stated in the introductory section of this chapter, we label the pattern of rates as progressive if the rates are positive and decreasing or negative and moving away from zero, as income rises. Therefore, if the net fiscal incidence of government is progressive, this means that the combined effect of expenditure and revenue programs is to reduce the income differences among families. If the pattern of residual rates is regressive, the net effect of government is to increase income differences.

As we stated in the discussion of the deficit, we present three sets of results, each based on a different assumption. The first set of results is computed on the assumption that both deficit components add to the income of families. Although we do accept this assumption as valid for 1961, we do not accept the conclusion

that deficits always add to the real income of families. These results are computed by subtracting the revenue rates presented in Table 3:4 from the expenditure rates given in Table 4:7. The second set of results are based on the assumption that the inclusion of a deficit distorts the true picture of government's impact on the income distribution. Since expenditures exceed revenues by approximately 11 per cent, we assume that all revenue rates are raised by this percentage to eliminate the deficit. This operation assumes, of course, that production, incomes, private and public expenditures, and other economic variables on which the analysis is based do not change as a result of the increased revenue rates. The third set of results is a modification of the second set. In computing these rates, we assume that not only is there an over-all balance of revenues and expenditures, but that they are equal at each level of government. In implementing this assumption, we assume an increase of 19 per cent in provincial revenue

TABLE 5:1—Net Fiscal Incidence of Government Revenue and Expenditure Programs, 1961

	Family money income class							
	Under \$2,000	\$2,000 2,999	\$3,000 3,999	\$4,000 4,999	\$5,000 6,999	\$7,000 9,999	\$10,000 and over	Average
(percentage of income)								
ALTERNATIVE I*								
Provincial.....	8.8	5.5	3.7	3.3	1.5	-.2	-3.7	1.3
Municipal.....	2.5	3.5	4.0	4.6	3.5	2.4	.3	2.8
Provincial and municipal.	11.3	9.0	7.7	7.9	5.0	2.2	-3.4	4.1
Federal.....	45.0	18.6	6.6	1.9	-1.8	-4.1	-8.0	1.5
Other provincial and municipal.....	-1.5	-1.2	-1.3	-1.2	-1.2	-1.2	-2.2	-1.4
Total.....	54.8	26.4	13.0	8.6	2.0	-3.1	-13.6	4.2
ALTERNATIVE II†								
Provincial.....	8.2	4.8	2.9	2.5	.6	-1.1	-5.0	.4
Municipal.....	1.4	2.9	3.4	3.9	3.0	1.8	-.3	2.2
Provincial and municipal.	9.6	7.7	6.3	6.4	3.6	.7	-5.3	2.6
Federal.....	42.6	16.9	4.6	-.4	-4.3	-6.5	-11.5	-.9
Other provincial and municipal.....	-1.8	-1.4	-1.7	-1.5	-1.5	-1.5	-2.6	-1.7
Total.....	50.4	23.2	9.2	4.5	-2.2	-7.3	-19.4	0.0
ALTERNATIVE III‡								
Provincial.....	7.8	4.6	2.6	2.1	.2	-1.5	-5.6	0.0
Municipal.....	-2.8	.6	.9	1.6	.8	-.1	-2.5	0.0
Provincial and municipal.	5.0	5.2	3.5	3.7	1.0	-1.6	-8.1	0.0
Federal.....	43.3	17.5	5.4	.5	-3.3	-5.5	-10.1	0.0
Other provincial and municipal.....	-.1	0.0	-.1	-.1	-.1	-.1	.6	0.0
Total.....	48.2	22.7	8.8	4.1	-2.4	-7.2	-17.6	0.0

Source: Tables 3:4 and 4:7.

*These rates are calculated on the assumption that the deficit between revenues and expenditures adds to the income of families.

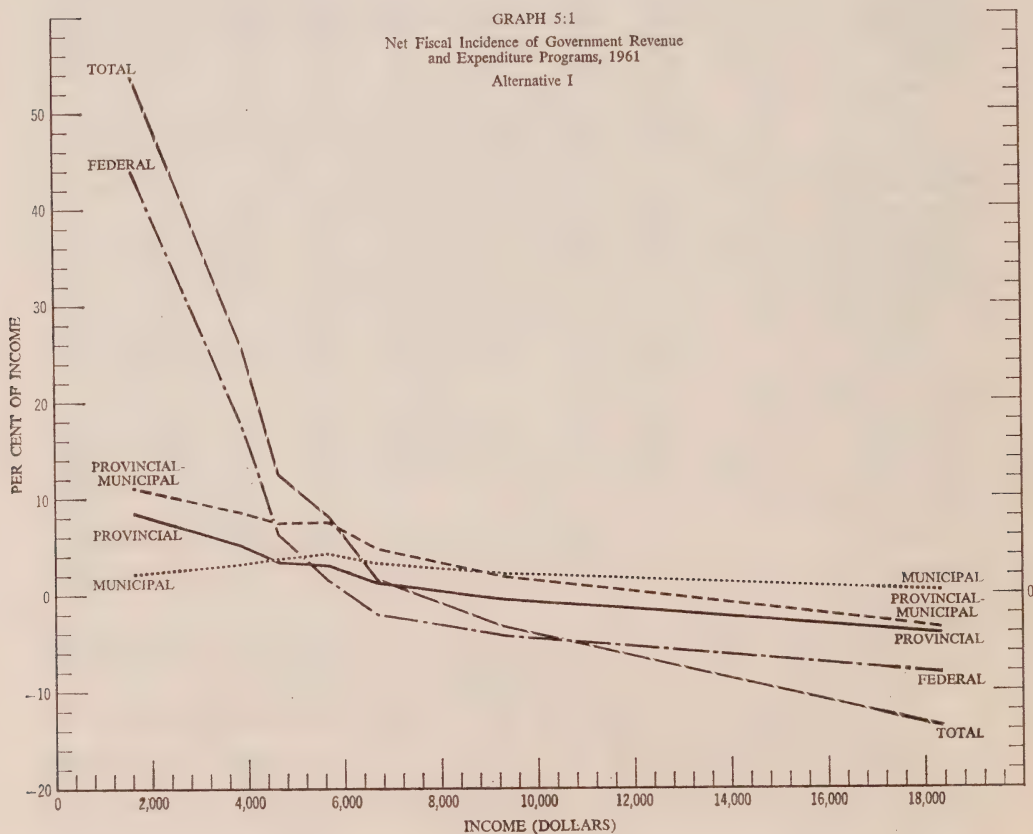
†These rates are calculated on the assumption that the deficit does *not* add to the income of families. All revenue rates are increased by the same proportion so that total revenue equals total expenditure.

‡These rates are calculated on the assumption that the deficit does not add to the income of families. All revenue rates at *each level of government* are increased by the same proportion so that total revenue and expenditure are equal for each government.

rates, 65 per cent in municipal rates, and 7 per cent at the federal level, and a decrease of the other provincial and municipal levies. The assumption about other economic variables remaining unchanged is more tenuous for this set of statistics than for the previous results. This set of results does, however, indicate the pattern of net fiscal incidence that might occur if each level of government raised as much revenue as it spent. These three sets of results are presented in Table 5:1.

We illustrate the results given in the table through the use of three graphs. Each graph corresponds to the results obtained by employing one of the three assumptions that are listed in the footnotes to Table 5:1. In all three graphs, the pattern of rates for each level of government is illustrated.

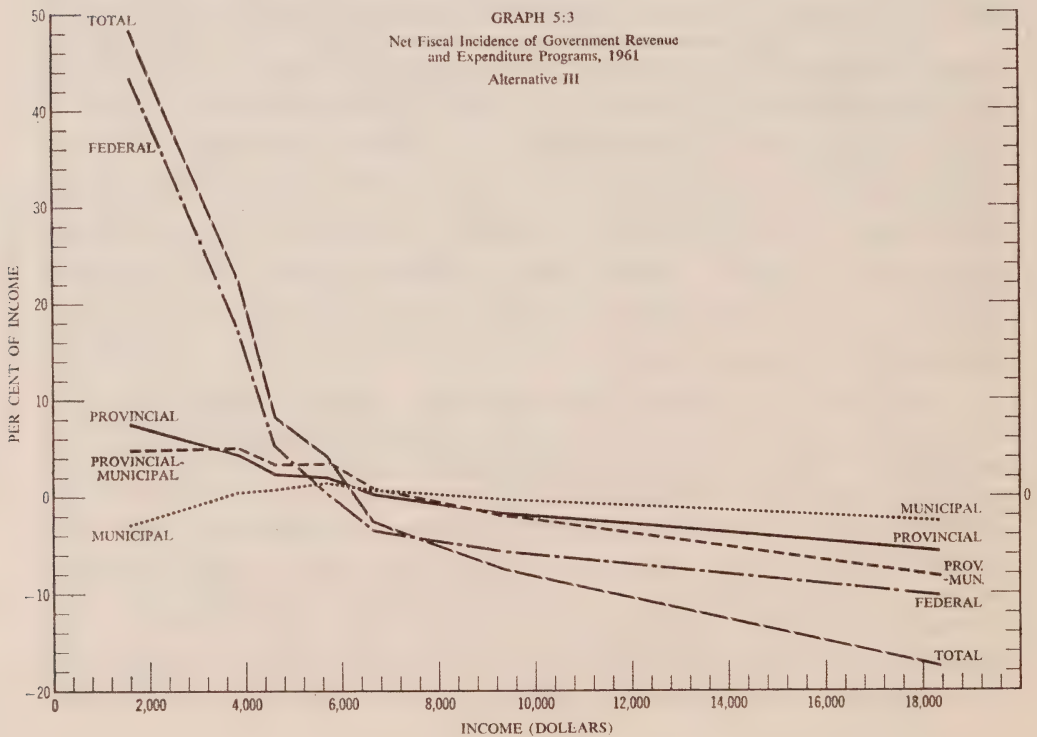
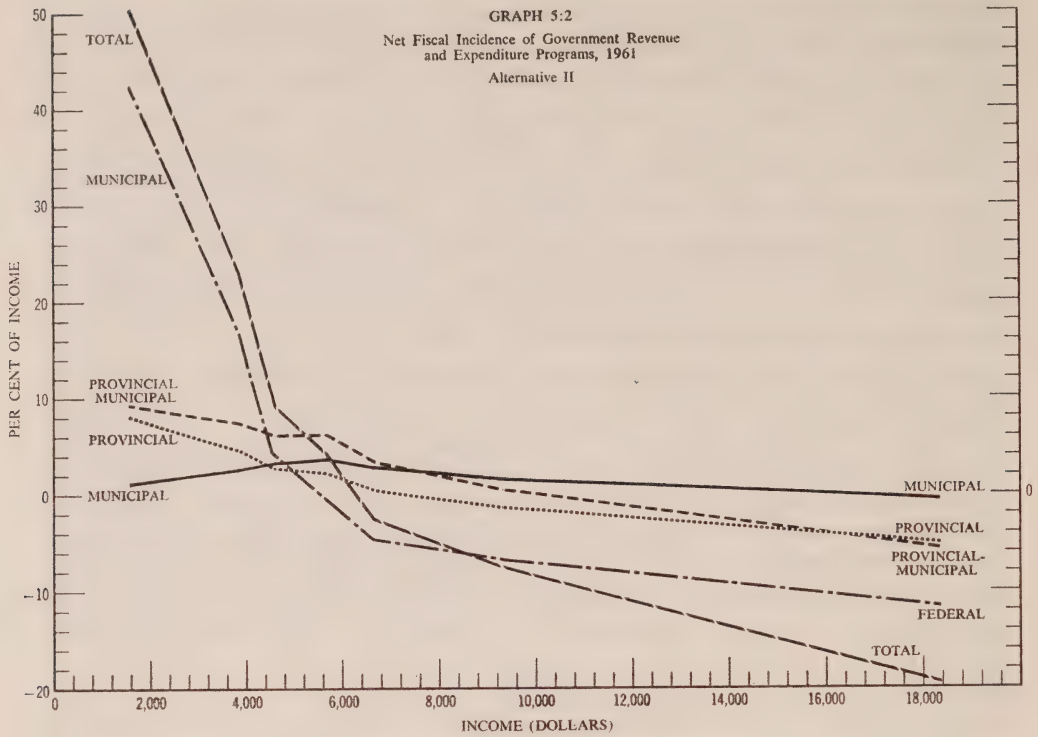
In Graph 5:1, we present the results shown under Alternative I in Table 5:1. This means that the revenue rates are not adjusted to eliminate the deficit. The pattern of rates for the provincial government is progressive throughout the entire income range. This is because the revenues are progressive and the expenditures are also distributed in a progressive manner. The provincial government accounts for nearly 9 per cent of the income received by families in the lowest income class, and removes an amount from families in the highest income class that is equal to 4 per cent of income. Since the provincial expenditures allocated to residents are greater than the revenues, there is an average gain in income to



families of more than 1 per cent of total income. The combined effect of municipal revenues and expenditures is to yield a pattern of rates that has the shape of an inverted U. This means that the effect of the municipal government is to increase the differences in income up to the middle income class and to equalize incomes over the last classes. This distribution of rates reflects primarily the regressive nature of the property tax and the regressivity in the first income classes of the elementary and secondary education expenditures. The deficit at the municipal level is proportionately larger than at any other level. Thus, as a result of municipal revenue and expenditure programs, the average net gain to families is close to 3 per cent. Combining the municipal and provincial rates, we obtain a distributional pattern that is mildly progressive up to the middle income class and very progressive over the remainder of the income classes. The range is from 11.3 per cent in the lowest class to -3.4 per cent in the highest category. The pattern of federal rates is more progressive than any other distribution. The range is from 45.0 per cent to -8.0 per cent but the largest drop is from 45.0 per cent in the first class to 18.6 per cent in the next category. This large drop between the first two classes reflects the pattern of social welfare expenditures. Although it is not shown on the graph, the other provincial and municipal pattern is nearly proportional but does indicate an inverted U-shaped distribution. The rates range from -1.5 per cent in the lowest bracket to -1.1 per cent in the second income class to -2.2 per cent in the \$10,000 and over category. Thus, the total distribution of rates is progressive throughout the entire income scale. The range in rates is 54.8 per cent in the lowest category to -13.6 per cent in the highest class. Since there is a combined deficit of approximately \$480 million, over 4 per cent of the income received by families is due to the fiscal activity of governments.

Graph 5:2 illustrates the pattern of rates derived from employing the second assumption given in Table 5:1. To eliminate the deficit, we increased all of the revenue rates by 11 per cent. The effect of this manipulation is simply to shift all of the revenue patterns upward by a uniform percentage, and the net fiscal incidence rate patterns downward. Thus, the shape of the graphs, and consequently the relationship among the income classes is the same in Graph 5:2 as in Graph 5:1. The only effect of removing the deficit is to remove the net average gain to families resulting from government revenue and expenditure programs. The combined gain from provincial and municipal fiscal activity drops from 4.1 per cent to 2.6 per cent, at the federal level the gain of 1.5 per cent becomes a loss of nearly 1 per cent.

In Graph 5:3 we employ the third alternative, which is a modification of the second. We not only eliminate the over-all deficit but eliminate it at each level of government. Since the deficit is proportionately larger at the provincial and municipal levels than at the federal level, the revenue rates of the lower-tier governments are increased by a larger proportion than the federal rates. The provincial and municipal revenues are less progressive than the federal revenues, so these calculations make the total revenue burden less progressive than using alternatives I and II. Consequently, the pattern of net fiscal incidence is less progressive if the third alternative is used rather than if either alternative I or II is employed. As compared to Graph 5:2, the municipal and provincial



patterns are shifted downward and the federal pattern is moved upward. The combined effect of these changes is to make the rate pattern for all government revenue and expenditure programs less progressive. From Graph 5:2 to Graph 5:3 the total rate for the under \$2,000 category drops from 50.4 per cent to 48.2 per cent, and the rate for the highest category changes from -19.4 per cent to -17.6 per cent.

FOOTNOTES

¹These statistics relate to Tables 3:3 and 4:6 and do not agree completely with deficits reported in some government publications.

²The impact of the two deficits may not be exactly the same because there may be some contractionary effect that results from the creation of additional debt.

CHAPTER 6

Summary and Conclusions

THE achievement of an equitable distribution of income is one of the generally accepted economic goals of government. Although many economic programs are aimed at achieving other goals, such as price stability and a more efficient utilization of economic resources, these programs do affect the distribution of income. In this study, we have examined the redistributive effects of some of these economic programs: the revenue and expenditure programs. More specifically we have attempted to estimate the impact of government fiscal activity on the Ontario distribution of income. The device used to measure this impact is a schedule of effective rates of income. These rates were computed by dividing the amount of government expenditure minus revenue deemed to accrue to families in each income class by the total income in that class. The schedule of effective rates was estimated in five steps. These five steps correspond to the previous five chapters.

In the first chapter, we set forth the scope and limitations of our investigation. There are three points discussed at length in Chapter 1 that are worth repeating here. The first point is that our investigation is conducted for the 1961 fiscal year because this is the latest year for which sufficient data are available. The second point is that only the expenditures and revenues of the federal, provincial and municipal governments are included in the analysis. Even though Ontario residents both paid the taxes and received the expenditures of foreign governments, the fiscal activity of these governments is neglected. The third point is that Ontario residents are grouped in two ways. They are grouped by families and unattached individuals because much of the basic data are available only on this basis. They are classified by income because we want to measure how families with different incomes are affected by the government expenditure and revenue programs.

The second chapter was devoted to estimating the income received by the families in each income class. Five definitions of income were explained. The first is family money income, which is the total amount of income received by a family before personal income taxes are paid. The second is personal income, which is family money income plus some non-money items such as the value of owner-occupied housing. The third income concept discussed is adjusted personal income, which is personal income plus some items such as retained earnings and the unshifted portion of the corporation income tax. The rationale behind these adjustments is that if taxes on income, such as the corporation tax, are allocated to families, the income on which these taxes is based should also be allocated to the recipients. The fourth income concept is pre-government income, which is adjusted personal income less government transfer payments. This definition of income is an estimate of what the distribution in total of income would be in the absence of government. The fifth definition of income is post-government

income, which is obtained by adding government expenditures and subtracting government revenues from pre-government income. This income concept is a measure of the total income received by families. Although it is somewhat artificial in terms of what families usually construe to be their income, we adopted the post-government income concept because it is the best of the five on both consistency and theoretical grounds.

The third chapter was devoted to government revenues. We first estimated the portion of each revenue that is paid by families not residing in Ontario. Non-residents bear the burden of these revenue programs chiefly through the purchase of commodities produced in the province and through the ownership of firms located in Ontario. The remaining portion was allocated to Ontario families by income class. Both of these operations were based on 1961 statistics and what we judged to be the best theoretical hypothesis regarding the incidence of each revenue. The revenue allocated to each class was then divided by the income in the class to derive the effective revenue rates.

Although the proportion of the Ontario provincial and municipal revenues borne by non-residents equals 27 per cent, there is a range from 65 per cent for the corporation tax to zero for hospital premiums and personal income tax. As shown by Table 3:4 and Graph 3:1, the revenue programs of the federal government equalize incomes much more than those of the provincial and municipal governments. Owing primarily to the personal income tax and the corporation income tax at high incomes, the federal revenue burden is very progressive. The provincial revenues are mildly progressive. The income taxes are again progressive but are counterbalanced to some extent by hospital premiums at low incomes and the consumption-based taxes at the higher income levels. The municipal burden is regressive, especially at the lower income levels. This is due primarily to the property tax. Thus, the over-all effect of government revenue programs is nearly proportional until the post-government income level of \$9,000 is reached.

In the fourth chapter, we estimated the impact of government expenditures on income. The procedure used to estimate the effective expenditure rates is the same as that used in deriving the tax rates. The proportion of provincial and municipal expenditures that is allocated to non-residents is 13 per cent and the percentage varies from over 70 per cent for interest expenditures to zero for many expenditures, including education and hospital care. Expenditures at all government levels are income-equalizing, but it is the federal expenditures that have the strongest effect. Within the federal sector, it is social welfare and, to a lesser extent, health expenditures that are dominant in redistributing income. All of the provincial and municipal expenditures, except interest payments, are progressive at incomes above \$7,000 but education expenditures are regressive up to nearly \$6,000. The regressive nature of the education expenditures at the lower part of the income range is explained by the high rate at which the number of children per family increase as we move up the income scale. For all government expenditures taken together, every expenditure category, except interest, equalizes incomes. Social welfare expenditures are very progressive at low incomes. These expenditures account for over 39 per cent of total income for the lowest income group and less than 8 per cent of income at the \$4,300 level.

In the fifth chapter, we brought revenue and expenditure results together. To analyse the total impact of government fiscal activity, we computed rates of net fiscal incidence by subtracting the revenue rates from the expenditure rates. Since government expenditures exceeded revenues in 1961, and because a larger proportion of revenues than expenditures were exported to non-residents, the average expenditure rate from Table 4:7 exceeds the average revenue rate from Table 3:4. Since it is questionable whether a deficit does increase the income of families, we calculated three sets of net fiscal incidence rates. The first set of rates assumed that the deficit did increase incomes in 1961, the second set of results are based on the assumption that all revenue rates were increased by the 11 per cent needed to close the deficit. For the third set, we assumed that the rates at each level of government were raised sufficiently to bring revenues and expenditures into equality. To accomplish this, federal rates were increased 7 per cent, provincial rates 19 per cent, and municipal rates 65 per cent. The results obtained by employing each of these assumptions indicate that the net effect of government is to equalize incomes, but this effect is less evident with the third set than with the other two. Since both expenditures and revenues tend to equalize incomes at the federal level, the combined effect is large, ranging from over 40 per cent for the lowest incomes to -8 per cent for the highest. To a lesser extent, provincial revenues and expenditures equalize incomes with the rates ranging from 9 per cent to -4 per cent. The schedule of rates resulting from the municipal fiscal activity is nearly proportional. The total effect of government is to reduce income differentials. The revenue and expenditure programs of government account for over 50 per cent of the income received by families in the lowest income class and government takes away an amount equal to 14 per cent of the income of families receiving \$18,000 of income.

Now that we have examined the impact of government revenue and expenditure programs on the distribution of family income, there are several conclusions that can be drawn from our analysis. First, government fiscal activity has a significant impact on the distribution of family income in Ontario. The sum of the income changes in the seven income classes is nearly \$1.3 billion or approximately one-tenth of the personal income received by Ontario families. Not only does government fiscal activity result in the redistribution of a large amount of income, but the pattern of redistribution is such that income inequalities are reduced. The families in the first five income classes gain and those in the two highest classes lose as a result of revenue and expenditure programs.

Second, with the exception of incomes in the highest class, expenditure is a much more powerful weapon in equalizing income than revenue. Expenditures form a declining proportion of income as income increases, except as between the two highest income classes. In addition, the range of effective rates is from 83 per cent in the lowest income class to 31 per cent in the highest class. Revenue rates are approximately proportional over the first six income classes and only range from a low of 22 per cent in the second class to 45 per cent in the highest class. Nearly all items within the expenditure category equalize incomes, but the most important expenditure in this regard is public welfare. One expenditure that does not fit this pattern, however, is education. Education expenditures

tend to increase income differences up to incomes of approximately \$6,000 and equalize incomes above that level. On the revenue side, most of the items show a mixed pattern that has both progressive and regressive elements in it. One exception is the personal income tax, which is progressive throughout the entire income scale. Thus, if the government wishes to further reduce income inequalities, expenditures are generally more effective than revenues, and the most effective use of specific items is to increase both the public welfare expenditures and the personal income tax.

Third, because of the magnitude of the programs and the mix of expenditures and revenues, the federal government redistributes much more income than all of the provincial and municipal governments. Therefore, under current fiscal arrangements, the capacity and responsibility for any substantial changes in the distribution of income rests with the federal government.

Fourth, over the income range that encompasses most Ontario families, the majority of provincial levies are proportional. The exceptions are the hospital premiums and the personal income tax. Thus, the provincial revenue system can be changed to further reduce income inequalities by reducing or eliminating the flat-rate hospital premiums and obtaining the loss in revenue through increasing the personal income tax. The provincial system could also be made more income-equalizing if the proportions of the personal income, corporation income and estate taxes returned to the provinces were increased. If the federal government returned a greater share of the personal income tax receipts and the provinces took over a larger proportion of the public welfare programs, the ability of the provinces to redistribute income would be greatly increased.

Fifth, because the property tax is regressive and because it forms over 80 per cent of total municipal revenue, exclusive of grants, the total revenue burden at the municipal level is regressive. Although the municipal expenditures tend to reduce income inequalities, the impact of the property tax is so great that municipal fiscal activity tends to increase income differences over the first four income classes. Given the limited number of revenue sources that can be successfully utilized by municipal governments, it appears that the net effect of municipal fiscal activity can be made income-equalizing over the entire income range only by increasing provincial and federal grants or by the sharing of progressive taxes. This means that the reduction of the responsibilities and expenditures of the municipal governments certainly would not make the municipal fiscal activity income-equalizing, although it may increase the equalizing effect of the combined fiscal activity of provincial and municipal governments.

Last, the proportion of provincial and municipal revenues and expenditures exported to non-residents is substantial: 27 per cent of the revenues and 13 per cent of the expenditures. These percentages vary greatly from one item to another. On the revenue side the percentage varies from 63 per cent for the provincial corporation income tax to zero for many items including the personal income tax and insurance premiums. For expenditures, the percentage varies from 68 per cent for interest to zero for most items including public welfare, education and health.

APPENDIX A

In conducting this study, we have utilized a large amount of statistical information. The basic data have been obtained from several sources and many of them have been subjected to operations in order to put them in a form convenient for our analysis. A description of the data and techniques employed in our analysis is undertaken in these two appendixes. Appendix B is devoted to a line-by-line description of how each of the tables in the study was derived. In this appendix we focus on the sources of the data and on the technique that was used to bring statistics for 1958 and 1959 forward to 1961.

There are some general shortcomings in the statistics that should be discussed before examining each data source. First, statistics for some specific items, such as the distribution of gasoline tax payments by income class, are not available and data that approximate the desired distribution must be used. Second, some of the statistics, and particularly the survey data underlying the percentage distributions, are only published on a national basis. For many of these we were able to obtain unpublished data for Ontario because the departments that collected the information could supply the statistics on a provincial basis. However, the provincial statistics are less reliable than those pertaining to all of Canada because the sampling error increases as the size of the sample is reduced. In addition, the sample was generally chosen to be representative of all of Canada and not necessarily of each province. In those situations where we had to utilize statistics based on all of Canada because data for Ontario could not be obtained, we have implicitly assumed that the populations of Ontario and Canada are identical in terms of the item described by the statistics. Third, the definitions, samples and time periods vary among the many sources of data which were combined in our analysis. For example, some of the data are on a calendar year basis and some are based on a fiscal year; some of the statistics are taken from a sample of the urban population and others are based on a non-farm population. These shortcomings in the basic statistics introduce some error into our results, but the direction and the magnitude of the error are unknown.

Nearly all of the information on the government revenues and expenditures for 1961 were taken from: (1) *Financial Statistics of Provincial Governments 1961*, (2) *Financial Statistics of Municipal Governments 1961*, and (3) *Financial Statistics of the Government of Canada 1961*.¹

The provincial statistics were based primarily on Tables 3 and 4 of the *Financial Statistics of Provincial Governments*. The income from the tax rental agreements was considered revenue from the personal income tax. The actual sales tax receipts for Ontario were multiplied by 12/7 to obtain an estimate of the revenue that would have been received if the tax had been in effect for the entire year. In addition social insurance contributions were included in our analysis but not in the government documents. On the expenditure side additions to the published figures were made for workmen's compensation payments, industrial

vacations, and government pensions. A subtraction was made for unconditional municipal grants.

The municipal statistics were based on Tables 9 and 10 of *Financial Statistics of Municipal Governments*. The differences between the items in these tables and the amounts included in our analysis are as follows: on the revenue side, the property tax receipts used in our analysis included \$2 million of property tax revenue obtained by the Province. We also included the pension contributions by municipal employees. We excluded the grants in lieu of property taxes from the provincial and federal governments to the municipalities; on the expenditure side, we included the government pensions.

The federal statistics were based on Tables 1 and 2 of the *Financial Statistics of the Government of Canada*. These statistics were altered for our analysis to include social insurance contributions and government pensions and to exclude intergovernmental transfers. In addition, for some items such as the Post Office we included the government deficit.

One problem of consistency in the government statistics should be pointed out. The federal and provincial statistics are on a fiscal year basis ending March 31, 1962, and the municipal statistics are on a calendar year basis.

As stated in the text, most of our information pertaining to consumption and the distribution of consumer purchases by income class was obtained from the statistics collected in the 1959 Urban Expenditure Survey.² This survey was limited to urban centres with a population of 15,000 and over, but there were no limitations on income or family size. The survey results showed the average expenditure per family (weighted average of families and unattached individuals) in each income class. These average consumption figures were multiplied by the number of families and unattached individuals in each class to obtain a distribution of total consumption by income class. The percentage distribution was then computed for the purpose of allocating government revenues and expenditures associated with consumer expenditures to the various income classes. The percentage distributions used in the study are presented in Table B1, Appendix B. These data were not, of course, ideal for our purposes. The sample size in some of the income classes (for Ontario) was very small and the sample was limited to families in urban centres of 15,000 and over. The expenditure patterns of these families may have been vastly different from the expenditure patterns of families who lived in cities and towns of under 15,000 population and in rural areas. However, even though these statistics were not perfect from our standpoint, there was no alternative source of data that we judged to be superior to the urban family expenditure survey. Although the 1958 *Farm Family Expenditure Survey*³ provided some information on the expenditure patterns of farm families, we rejected the alternative of combining the urban and farm data. We rejected this alternative because we could not obtain data for Ontario at the time we conducted the study and there appeared to be no obvious method of adjusting the data for all of Canada to describe Ontario. In addition, it appeared that the results of the farm survey were less reliable than those obtained from the urban survey.

Most of the percentage distributions that were used to allocate the components of family money income among the seven income classes were derived

from data collected for the *1961 Survey of Consumer Finances*.⁴ In addition many of the distributions used to allocate items of personal saving and wealth, such as liquid assets, residential property and insurance premiums, were obtained from data collected for the *1958 Survey of Consumer Finances*.⁵ These surveys included only non-farm families and unattached individuals. They excluded families and individuals whose major source of income was military pay and allowances or farm income. In terms of income sources the surveys were restricted to money income. They excluded imputed items such as imputed rent and interest. The amount of income by source received by families and individuals in each income class was presented in the survey results. From these data a percentage distribution for each source of income was obtained. The same procedure was used to obtain percentage distributions for items in the savings and wealth category. These data were judged to be superior to those obtained from the *Urban Family Expenditure Survey* because they were based on a larger sample and on a larger proportion of the total population. However, the *Survey of Consumer Finances* does exclude farm and military families. Even though the survey data suffer (for our purposes) from this omission, we did not combine these statistics with those on farm and military families. This is because the number of families in these two categories was less than 10 per cent of the total in the province and because the distribution of farm families appeared to be unreliable.

We did combine the data from the *Survey of Consumer Finances* with the *Urban Family Expenditure* data in some cases. Although this introduced some error because of the differences in the definition of a family and because the samples were taken from different parts of the population, we judged that the error was more than compensated for, because we obtained a more reliable estimate of the distribution of families by income class to use with the expenditure data.

The statistics for the family money items and most of the imputed items were obtained from the *National Accounts*.⁶ These published statistics were supplemented to some extent by unpublished data supplied by the National Accounts Division of D.B.S.

The data used to compute the percentage distributions for dividends and rental income were obtained from the Ontario Department of Treasury. These statistics pertain to Ontario and were part of the data collected by the Department of National Revenue for *Taxation Statistics*.⁷ Two limitations of these data should be noted. First, statistics for the 1962 taxation year were used because we could not obtain the distribution series for Ontario for 1961. Second, families that were in a given income class in terms of the expenditure and income surveys may not have been in the same class in the taxation statistics. This is partly because the definition of income is different in the two sources and partly because the survey data are on a family basis whereas the taxation statistics are based on tax returns. The definition of income in the survey data is broader than in the tax data because it includes transfer payments and other forms of non-taxable income and it does not allow for any deductions and exemptions. In addition, the survey data may include the earnings of two or more members in a family. In the taxation statistics, family members would be considered as separate individuals if each filed a

tax return. These differences have the effect of placing a greater proportion of families in the lower income classes if taxation data are used instead of survey data. Thus, if we assume that the survey data place families correctly we have understated the proportion of dividends and rental income that were received by high income families.

Information on tourist expenditures was supplied by the Ontario Department of Travel Research. In many cases, the data we required were not available in any published form and the Department of Travel Research made some rough estimates for us. In making these estimates the following were used: (1) a study entitled *Visitors 63* published by the Government of the Province of British Columbia, (2) Various D.B.S. publications, (3) a report on tourist promotion and foreign tourist expenditures in Ontario, (4) other studies and statistics that were available within the department.

Data on municipal assessment were obtained from the Ontario Department of Municipal Affairs. The residential, business and farm assessment data for land and improvements were obtained by summing the values given on the "Clerk's Return" for each municipality.

The information used to distribute the benefits of road expenditures and burdens of motor vehicle revenues between users and non-users and among the different classes of users was obtained from the Ontario Department of Transport.

The reply of Minister Gordon to the question by Mr. Balcer, regarding the distribution of federal revenues and expenditures by province⁸ provided information with which to allocate some of the federal revenues to Ontario. Unfortunately, this information was not detailed enough to use for very many of the revenue and expenditure items.

The results of the *Urban Family Expenditure Survey* are for 1959 and the information provided by the *Survey of Consumer Finances* on wealth and savings is for 1958. We employed a common procedure for both of these sets of data to bring them forward to 1961. In this procedure, which was suggested by Professor Gillespie, we assumed that the relationship between the item under consideration and income does not change over time. For simplicity, we will describe the procedure for extrapolating the expenditures. The estimate of the average expenditure in each class was multiplied by the weighted number of families and unattached individuals in that class. The total expenditure in each class was then divided by the amount of family money income allocated to the class for 1959, to obtain the percentage of income devoted to the expenditure. Next, the percentage for each class was then multiplied by the amount of family money income allocated to the class in 1961 to obtain a hypothetical distribution of expenditures for 1961. The percentage distribution for 1961 was then obtained by dividing the expenditure allocated to each class in the previous step by the total expenditure for all classes.

FOOTNOTES

- ¹All three of these publications were written by Dominion Bureau of Statistics and printed by The Queen's Printer in Ottawa in 1964.
- ²Dominion Bureau of Statistics, *Urban Family Expenditure 1959* (Ottawa: Queen's Printer, 1963).
- ³*Ibid.*, *1958 Farm Survey Report, No. 1, Expenditures, Receipts and Farm Capital* (Ottawa: Queen's Printer, 1962), p. 8.
- ⁴*Ibid.*, *Distribution of Non-Farm Incomes In Canada By Size, 1961* (Ottawa: Queen's Printer, 1964).
- ⁵*Ibid.*, *Incomes, Liquid Assets and Indebtedness of Non-Farm Families in Canada, 1958* (Ottawa: Queen's Printer, 1960).
- ⁶*Ibid.*, *National Accounts, Income and Expenditure* (Ottawa: Queen's Printer, 1962).
- ⁷Department of National Revenue, *1964 Taxation Statistics, Part One—Individuals* (Ottawa: Queen's Printer, 1964).
- ⁸*Reply of the Minister of Finance to Question No. 741 by Mr. Balcer*, made order for return Wednesday, July 22, 1964, House of Commons Debates, Vol. 6, 1964, p. 5809.

APPENDIX B

This appendix describes how each line in each of the tables was computed. This information will allow the interested reader to retrace our steps and any reader who disagrees with our definitions and assumptions and/or our methods of implementing these definitions and assumptions to reconstruct the tables in the study according to his preferences.

The results of distributing incomes, revenues and expenditures are given in Tables 2:1, 3:3 and 4:6, but the percentage distributions utilized in these operations are not presented there. Thus, to facilitate the description of the tables in the text, we have constructed the following table which includes all of the percentage distributions used in the study.

Since the tables are to be described line by line, there will be numerous references to each of the government documents discussed in Appendix A. In order to avoid repeating the full name of the source each time, we use the following abbreviations:

1. <i>Survey of Consumer Finances</i>	—	S.C.F.*
2. <i>Urban Expenditure Survey</i>	—	U.E.S.*
3. <i>Financial Statistics of Provincial Governments</i>	—	F.S.P.G.
4. <i>Financial Statistics of Municipal Governments</i>	—	F.S.M.G.
5. <i>Financial Statistics of the Government of Canada</i>	—	F.S.G.C.
6. <i>National Accounts</i>	—	N.A.
7. <i>Taxation Statistics</i>	—	T.S.
8. Ontario Department of Transport	—	O.D.T.*
9. Ontario Department of Travel Research	—	O.D.T.R.*
10. Ontario Department of Municipal Affairs	—	O.D.M.A.*
11. Minister Gordon's Answer to Mr. Balcer's Question	—	G.A.B.

TABLE B1.

Lines 1, 3-10: These distributions are obtained directly for Ontario from S.C.F. 1961. "Investment income", line 3, includes bond interest, dividends, bank interest, mortgage interest, net rental income and other investment income. "Other transfer payments", line 7, includes veterans' pensions, unemployment benefits, workmen's compensation, direct relief and miscellaneous transfer payments.

Line 2: This distribution is based on information given in The Canadian Tax Foundation, *National Finances 1961-62*, p. 97, which gives the employee and employer contribution by income level. The following procedure for estimating the distribution was suggested by Professor Gillespie. Since no contribution is made on incomes above \$5,460, we computed the contribution rate as a percentage of the annual wage for the relevant income brackets. We then multiplied these rates by the distribution of wage and salary income.

*The reference is to unpublished data unless otherwise noted.

TABLE B1—Distributive Series, 1961

Line	Series	Under \$2,000	\$2,000– 2,999	\$3,000– 3,999	\$4,000– 4,999	\$5,000– 6,999	\$7,000– 9,999	\$10,000 and over	Total
(1)	Wages and salaries.....	1.4	3.8	7.4	14.5	32.4	26.6	13.9	100.0
(2)	"Covered" wages and salaries.....	5.5	12.9	25.0	39.7	16.9	—	—	100.0
(3)	Investment income.....	8.5	12.3	5.9	4.1	10.5	20.1	38.6	100.0
(4)	Net unincorporated business income.....	2.4	6.3	9.5	10.4	18.4	18.1	34.9	100.0
(5)	Family allowances.....	3.1	7.4	10.5	17.6	36.5	18.7	6.2	100.0
(6)	Old Age Security fund payments.....	49.8	13.1	6.8	6.6	9.7	8.8	5.2	100.0
(7)	Other transfer payments.....	21.9	18.9	10.6	13.7	18.4	13.2	3.3	100.0
(8)	Family money income.....	2.5	5.2	7.8	13.5	27.7	24.6	18.7	100.0
(9)	Number of families and unattached individuals (non-farm excluding military).....	17.3	10.0	11.2	15.3	25.3	15.0	5.9	100.0
(10)	Pensions and annuities.....	13.8	14.6	13.6	8.5	17.7	20.1	11.7	100.0
(11)	Number of farm operators.....	41.7	19.0	13.6	9.0	9.5	4.4	2.8	100.0
(12)	Farm operator family income solely from farm operations.....	1.8	16.4	17.0	14.7	20.0	13.3	16.8	100.0
(13)	Military pay and allowances.....	.5	3.7	11.3	33.2	26.6	19.0	5.7	100.0
(14)	Dividends received.....	3.1	4.8	4.7	5.0	8.5	10.6	63.3	100.0
(15)	Liquid assets.....	13.8	8.0	6.6	9.8	23.8	22.0	16.0	100.0
(16)	Insurance premiums paid.....	1.7	3.5	8.0	12.0	28.2	25.0	21.6	100.0
(17)	Market value of owner-occupied homes.....	7.2	5.8	7.5	13.8	28.5	22.0	15.2	100.0
(18)	Individual income tax.....	.5	.9	3.9	9.1	29.7	27.7	28.2	100.0
(19)	Rent payments.....	11.4	8.2	15.7	21.8	27.3	12.6	3.0	100.0
(20)	Net rental income.....	8.9	10.6	8.9	6.3	15.7	12.6	37.0	100.0
(21)	Factor incomes, 1961.....	2.1	5.1	7.8	13.5	28.2	25.2	18.1	100.0
(22)	Hospital insurance premiums.....	12.9	9.3	10.9	15.9	27.2	16.7	6.5	100.0
(23)	Automobile purchases.....	.0	.6	3.5	18.6	27.2	32.7	17.4	100.0
(24)	Automobile operating expenditures.....	.7	4.0	7.6	15.6	34.5	24.6	13.0	100.0
(25)	Non-farm children under 16 years.....	3.3	6.5	11.6	21.6	32.3	18.4	6.3	100.0
(26)	Estimated distribution of university students.....	3.8	5.1	6.8	11.9	25.2	21.2	26.0	100.0
(27)	Hospital care benefits (no. of individuals).....	9.4	8.3	11.2	18.1	29.3	17.3	6.4	100.0
(28)	Estimated distribution of veterans.....	9.3	9.2	9.7	14.8	25.8	21.5	9.7	100.0
(29)	Expenditures on other transportation.....	6.9	7.9	12.0	12.2	28.1	21.7	11.2	100.0
(30)	Expenditures on food.....	8.2	6.8	10.1	15.5	28.9	20.6	9.9	100.0
(31)	Expenditures on liquor and tobacco.....	5.0	5.0	9.9	15.8	32.0	22.3	10.0	100.0
(32)	Expenditures on liquor.....	3.6	3.0	9.0	14.9	30.6	26.6	12.3	100.0
(33)	Expenditures on tobacco.....	6.2	6.7	10.7	16.7	33.1	18.6	8.0	100.0
(34)	Expenditures on movies, plays, concerts, sports events.....	5.5	5.0	6.4	14.1	30.8	25.2	13.0	100.0
(35)	Expenditures on equipment, fees and licences for sports.....	7.9	3.4	6.5	7.2	21.9	28.6	24.5	100.0
(36)	Taxable consumption: Ontario retail sales tax.....	4.0	5.3	9.4	14.2	28.6	24.7	13.8	100.0
(37)	Taxable consumption: manufacturers' sales tax.....	3.5	4.8	8.4	15.1	29.9	24.9	13.4	100.0
(38)	Total consumption.....	6.2	6.0	9.3	14.9	29.3	22.5	11.8	100.0
(39)	General expenditures and taxes.....	11.4	8.0	9.5	13.7	24.5	17.5	15.4	100.0
(40)	Property tax on business.....	5.4	5.7	8.2	12.5	24.3	19.7	24.2	100.0
(41)	Property tax assessment.....	9.2	7.0	9.5	14.4	26.0	18.9	15.0	100.0
(42)	Value of farm property.....	31.7	16.1	12.5	10.8	13.5	8.2	7.2	100.0

Lines 11-12: These distributions on farm operators and farm income were obtained from Professor Gillespie, who estimated them from data provided by D.B.S., *Farm Income and Expenditure Survey, 1958 (Schedule A)*, Table AFR-11. These series were constructed for all Canada and they were not adjusted to make them directly applicable to Ontario because of the absence of any information on how to adjust them.

Line 13: The distribution for "military pay and allowances" was obtained directly for Ontario from the Department of Defence. The data were for 1963 but we assumed that they accurately described the distribution in 1961.

Lines 14 and 20: These distributions were obtained directly for Ontario from the Ontario Treasury Department and were taken from T.S. for the taxable year 1962. The 1962 taxable year was used because no data were available for 1961.

Lines 15-17: These distributions were obtained directly for Ontario from S.C.F. 1958. The procedure described in Appendix A was used to bring these distributions forward to 1961. As mentioned previously, this adjustment procedure assumes that the relationship between income and various assets held does not change over the time period involved.

Lines 18-19: The distributions for "individual income tax" payments and "rent payments" were obtained directly for Ontario from U.E.S. 1959. The procedure described in Appendix A for bringing these distributions forward to 1961 was utilized.

Line 21: The distribution for "factor incomes" was obtained by summing in each income class the retained earnings, farm income, wages and salaries, military payments, unincorporated business income, investment income and miscellaneous factor income and then dividing the income in each class by the total factor income.

Line 22: The distribution for "hospital insurance premiums" was computed from the family and unattached individual components of line 9. Since families pay double the rate of single individuals, the number of families in each class was multiplied by 2 and added to the number of single individuals in the class. The total in each class was then divided by the sum of the totals of all seven classes.

Lines 23-24: The distributions were obtained directly for Ontario from U.E.S. 1959. These distributions were then brought forward to 1961, as for lines 18-19. The distribution of automobile operating expenditures includes chiefly expenditures on gasoline and oil but also repairs and insurance.

Line 25: The distribution for "non-farm children under 16 years" was obtained directly for Ontario from S.C.F. 1958 and brought forward to 1961.

Line 26: The distribution of university students for all of Canada was obtained from Professor Gillespie and was adjusted to describe Ontario using the procedure discussed in Chapter 4.

- Line 27:* The distribution "Hospital care benefits" is a hypothetical distribution based on the assumption that each individual in the province is likely to receive the same amount of hospital care. The series was computed by summing the number of children under 16 and the number of single individuals and twice the number of families in each income class and then dividing the total in each class by the sum of the totals for each of the seven classes.
- Line 28:* The estimated distribution of veterans for all of Canada was obtained from Professor Gillespie and his technique for estimating this distribution was discussed in Chapter 4. This procedure is the same as the one used to adjust the distribution for university students, and is similar to the procedure used to bring the series forward from 1959 to 1961.
- Lines 29-35:* These series were obtained directly for Ontario from U.E.S. 1959 and brought forward to 1961 in the usual manner.
- Line 36:* The basis for this series, "Taxable consumption: Ontario retail sales tax", was the U.E.S. 1959. The individual items in each of the expenditure categories were examined to determine whether they were taxable. The taxable expenditures in each income class were multiplied by the number of families and individuals in each class. The expenditures in each class were then summed and the percentage distribution was computed by dividing the sum of the taxable expenditures in each class by the total taxable expenditures for all seven classes. The percentage of the expenditures deemed taxable for each major expenditure category is given in Chapter 3. This series was computed for 1959 and brought forward to 1961 in the usual manner.
- Line 37:* The series for the manufacturers' sales tax was computed in the same manner as for the Ontario sales tax except that the proportion of the expenditure in each expenditure category that was deemed to be taxable was obtained from Professor Gillespie.
- Line 38:* The distribution for total consumption was obtained directly for Ontario from U.E.S. 1959 and brought forward to 1961 in the usual manner.
- Line 39:* The distribution for "general expenditures and taxes" was obtained by combining lines 8, 9, 14 and 27. This is as a result of assuming that one-fourth of the general items should be allocated to families on the basis of the number of families and unattached individuals in each class; one-fourth according to the number of people in each class; one-fourth according to the amount of family money income in each class; and one-fourth according to the business income received in each class. Line 14, dividends received, has a smaller weight in this combination than the other three lines because part of the general items allocated to business income is received by non-residents of the country.
- Line 40:* The distribution of business property tax payments was obtained by taking a weighted average of lines 14 and 38. The weight given to line 14 was the proportion of the business property tax burden assumed to be borne by owners of businesses in Ontario. The remainder of the tax on business was assumed to be shifted forward to consumers.

Line 41: The distribution of total property tax assessment was obtained by taking a weighted average of lines 17, 19, 20, 38, 14, 30, 42. The weight given each line was equal to the proportion of the property assessment allocated to: owner-occupied housing, improvements portion of rental housing, land portion of rental housing, improvements portion of business property, land portion of business property, improvements portion of farm property, and land portion of farm property.

Line 42: The distribution for the value of farm property is for all of Canada, and it was obtained from Professor Gillespie.

TABLE 2:1

Line 1: Wages and salaries: The total for Ontario was obtained directly from N.A. and it was distributed by line 1, Table B1.

Line 2: Military income: The total military pay and allowances for Ontario was obtained directly from N.A. and was distributed by line 13, Table B1.

Line 3: Farm income: The total net farm money income for Ontario was obtained directly from N.A. and it was distributed by line 12, Table B1.

Line 4: Investment income: The total investment income for Ontario was obtained directly from N.A. and it was distributed by line 3, Table B1.

Line 5: Non-farm unincorporated income: The total net non-farm unincorporated income for Ontario was obtained directly from N.A. and was distributed by line 4, Table B1.

Line 6: Private pensions: The total for Ontario was obtained from Professor Gillespie's study by multiplying the total Canadian pensions by the ratio of wages and salaries in Ontario to wages and salaries in Canada. This total was distributed by line 1, "wages and salaries", Table B1.

Line 7: Transfer payments: For all purposes transfer payments were divided into three categories: family allowances, old age payments and other transfers. The totals for these categories were obtained for Ontario directly from N.A. Family allowances were distributed by line 5, Table B1; old age payments were distributed by line 6, Table B1; other transfer payments, which include veterans' pensions, unemployment benefits, direct relief, workmen's compensation and other items were distributed by line 7, Table B1.

Line 8: Total money income: Total money income is the sum of lines 1 through 7.

Line 9: Imputed rent: The total was obtained directly for Ontario from N.A. and it was distributed by line 17, Table B1.

Line 10: Imputed interest: The total imputed interest for Ontario was obtained by multiplying the total imputed interest for Canada by the ratio of liquid assets held by Ontario residents to the total liquid assets held by all Canadians. This total was distributed by the series "liquid assets", line 15, Table B1.

Line 11: Food and fuel consumed on the farm: The total food and fuel grown and consumed on the farm was obtained for Ontario directly from N.A. and was

distributed by line 11, Table B1, "number of farm operators". Although this series is imperfectly related to food and fuel consumed on the farm, we judged that it was superior to any other available series. This is because we believe that food and fuel grown and consumed on the farm is related more directly to the number of farmers than to farm income, the primary alternative.

Line 12: Investment income of life insurance companies: This total was obtained for Ontario directly from N.A. and was distributed by line 16, "insurance premiums paid", Table B1. The use of this series to distribute this imputed income assumes, of course, that insurance premiums are directly related to the accrued investment income of life insurance companies.

Line 13: Total imputed income: The total imputed income is the sum of lines 9 through 12.

Line 14: Personal income: Personal income is the total of lines 8 and 13. Although this point is discussed at greater length in Chapter 2, it should be pointed out that our definition of personal income differs slightly from that of the National Accounts.

Line 15: Retained earnings: The total for Ontario was computed in two steps. The total retained earnings for all of Canada was obtained from Professor Gillespie. This Canadian total was first reduced to reflect the foreign ownership of Canadian industry. This was accomplished by multiplying the Canadian total by the ratio of foreign investment to total investment in Canada. The Ontario total was then obtained by multiplying this product by the ratio of dividends received in Ontario to total dividends received by all Canadians. The Ontario total was then distributed by line 14, Table B1. This method of obtaining the Ontario total is described in greater length in Chapter 2.

Line 16: Unshifted portion of corporation income tax: This total for Ontario is a sum of three parts. One part is the federal tax that rests on Ontario stockholders; a second part is the Ontario corporation tax that rests on Ontario stockholders; and the third part includes the corporation taxes levied by the other provinces that rest on Ontario stockholders. The total tax figures are taken from Table 3:1 and the techniques used to obtain the Ontario totals are described in Chapters 2 and 3. The Ontario total was distributed by line 14, Table B1.

Line 17: Social insurance contributions borne by workers: This category includes public service pensions, workmen's compensation, industrial vacations and unemployment taxes. The totals for these items were obtained from Table 3:1 and the technique for determining the Ontario totals is described in Chapters 2 and 3. The workmen's compensation and industrial vacations payments and the public service pensions which rest on Ontario residents were distributed by line 1, "wages and salaries", Table B1. Although we recognize that the series "wages and salaries" is an imperfect measure of these payments because the payments are likely to be concentrated more in the lower income class than are wages and salaries, there appeared to be no superior alternative. The unemployment payments resting on workers were distributed by line 2, Table B1.

Line 18: Property tax and natural-resource revenues borne by stockholders and farmers: The property tax category includes the property and business taxes levied by all provinces that were borne by Ontario stockholders and farmers. The natural-resource category includes all of the taxes and fees levied by all of the provinces and the federal government that were deemed to accrue to Ontario stockholders. Approximately two-thirds of this total of \$94 million resulted from property and business taxes and one-third from natural-resource taxes and fees. The total taxes and fees of \$94 million was distributed by line 14, "dividends received", Table B1.

Line 19: Miscellaneous taxes and fees: This category includes minor taxes, fees and charges levied by all governments in Canada that were deemed to accrue to Ontario stockholders. In general one-fourth of the total of this miscellaneous category was allocated to business income and the Ontario shares of the federal, Ontario provincial and municipal, and other provincial-municipal revenues were obtained in the same manner as for the corporate income tax.

Line 20: Total adjustments: This total was obtained by summing lines 15–19.

Line 21: Total adjusted personal income: This total was obtained by adding lines 14 and 20.

Line 22: Government interest and transfer payments: This total was obtained by summing the interest payments and the transfer payments received by Ontario residents from all levels of government. These statistics were obtained from Table 4:6 where the totals are already distributed by income class.

Line 23: Total pre-government income: This total was obtained by subtracting line 22 from line 21.

Line 24: Government revenues: This total was obtained from the last line of Table 3:3.

Line 25: Government expenditure: This total was obtained from Table 4:6.

Line 26: Total post-government income: This total was obtained by adding line 25 to line 23 and subtracting line 24 from this sum.

TABLE 3:1

Line 1: Personal income tax: The Ontario total and Ontario share were obtained from F.S.P.G. The federal total and the Ontario share of the federal total were obtained from G.A.B.

Line 2: Corporation income tax: The totals for the Ontario corporation income tax and those of the other provinces were obtained from F.S.P.G. The federal total was obtained from F.S.G.C. The Ontario shares of the corporation income taxes levied by Ontario, the other provinces, and the federal government were obtained by the techniques described in Chapters 2 and 3.

Line 3: General sales tax: The Ontario total was obtained by multiplying the yield for seven months given in F.S.P.G. by 12/7 to estimate the yield that Ontario would have obtained if the tax had been in effect for the entire year. The Ontario share of the Ontario tax was obtained by subtracting the amount of

the tax that was shifted forward to foreigners because some producer goods were taxed. The federal total was obtained from F.S.G.C. and the Ontario share of it was computed by multiplying the total tax receipts by the ratio of consumption in Ontario to total Canadian consumption. The consumption data for Ontario and for all of Canada were taken from U.E.S.

Line 4: Highway-user revenues: The Ontario total was obtained from F.S.P.G. by adding together motor fuel revenues and motor vehicle licences. The Ontario share was obtained from this total by assuming that passenger vehicle owners bear one-half of the tax and fees and commercial vehicles bear the remaining one-half. Eighty per cent of the tax and fees resting on passenger vehicle owners was assumed to be borne by residents of the province and 41 per cent of the tax and fees initially borne by commercial vehicle owners was borne by residents of the province. The other provincial and municipal road-user levies borne by Ontario residents resulted from Ontario tourists travelling in the other provinces and from Ontario consumers who used goods that were transported across or from the other provinces. In making these calculations, we assumed that Ontario residents paid approximately 3 per cent of the gasoline taxes (levied by other provinces) that were paid by passenger vehicle owners. We also assumed that Ontario residents bore approximately one-fourth of the licences and fuel taxes paid by commercial vehicle owners to the other provinces.

Line 5: Selective excise taxes: The Ontario total was obtained from F.S.P.G. and the Ontario share was obtained by subtracting the amount paid by tourists in the province. We assumed that non-residents paid 10 per cent of the liquor profits and licences and 30 per cent of the admissions and pari-mutuel taxes. These estimates were based on information supplied by the Ontario Department of Travel Research. The federal total was obtained from F.S.G.C. The Ontario portions of the taxes included in this category were obtained by multiplying the Canadian totals by the ratio of the consumption of the item in Ontario to total consumption in Canada. The consumption estimates were again based on U.E.S.

Line 6: Succession duties: The Ontario total was obtained from F.S.P.G. and the estimate of the tax borne by non-residents was supplied by the Succession Duty Branch of the Ontario Treasury. The federal total was obtained from F.S.G.C. and the Ontario share of the estate tax was obtained from G.A.B.

Line 7: Import duties: The federal total was obtained from F.S.G.C. and the Ontario share was obtained by first subtracting the tax borne by non-residents of Canada and multiplying this result by the ratio of total consumption in Ontario to total consumption in Canada.

Line 8: Property tax: The total for all provinces was obtained from F.S.M.G. The Ontario share of the taxes was obtained by the use of the incidence assumptions described in Chapter 3. In those provinces where a business tax was levied, the property tax receipts include both the property tax and business tax revenue.

Line 9: Natural-resource revenue: The total was obtained from F.S.P.G. and it includes three categories of items: taxes, licences and fees. Some of the items were treated like the corporation income tax, others like a general sales tax, and others like excise taxes on specific expenditures such as camping and hunting and fishing.

Line 10: Social insurance contributions: The Ontario and federal totals were obtained from N.A. The Ontario share of the federal total was also obtained largely from N.A. The Ontario share of the Ontario taxes and the federal levies also results from the incidence assumptions employed in Chapter 3. The Ontario provincial and municipal programs include workmen's compensation, public service pensions, industrial employee vacations. Federal levies include the unemployment taxes and public service pension contributions.

Line 11: Other taxes and miscellaneous revenue: This category includes hospital insurance premiums, sales and services, fines and penalties and licences and fees and miscellaneous revenues. The hospital insurance premiums were assumed to rest completely on Ontario residents, but the other Ontario revenues were assumed to be borne partly by receivers of investment income, some of whom live outside the province. The proportion of federal expenditures in this category accruing to Ontario residents was determined by employing the formula for distributing miscellaneous revenues and expenditures, described in Chapters 3 and 4. The general revenues obtained by the other provincial-municipal governments which accrued to Ontario residents were also determined by employing this formula. Other taxes, such as the provincial sales taxes, were also included in the miscellaneous category rather than in specific categories.

Line 12: Total: Line 12 was obtained by summing lines 1 through 11.

TABLE 3:2

Table 3:2 is based on data supplied by the Ontario Department of Municipal Affairs. The data supplied by this department showed the value of land and improvement assessment for residential, business and farm. To obtain a breakdown in the residential category between owner-occupied housing and residential housing, we employed data from the 1958 S.C.F. In using these data we assumed that renters spent the same amount on housing as homeowners in each income class. These assessment figures were then used to distribute the property tax revenue among the eight categories shown in the table. The only adjustment to the assessment figures was to assume that businesses paid 10 per cent more per dollar of assessment than the other three categories because of provincial grants to municipalities.

TABLE 3:3

The totals for the items in the last three columns of Table 3:3 (Distribution to Ontario residents, Distribution to other Canadian and foreign residents, Total distribution) were taken directly from Table 3:1. The only deviations we have made from Table 3:1 involved placing hospital premium

payments in a separate category and dividing property and business tax receipts into property and business categories. The total for hospital premiums was obtained directly from F.S.P.G. In dividing the published property and business tax receipts into the two categories we assumed that the business tax receipts were equal to 40 per cent of the property tax paid by businesses. This percentage was determined from the study of the business tax by William Merritt and other studies conducted by The Ontario Committee on Taxation. The remainder of the description of this table will concentrate on the series used to distribute each of the Ontario shares of the various revenues.

Lines 1 and 17: Personal income tax: These totals were distributed by line 18 of Table B1.

Lines 2, 18 and 26: Corporation income tax: The unshifted portion of the tax was distributed by line 14, Table B1. The portion of the tax assumed to be shifted forward to consumers was distributed by line 38, Table B1.

Line 3: General sales tax: This total was distributed by line 36, Table B1.

Lines 4 and 27: Highway-user revenues: These totals include three sub-categories. The motor vehicle revenues initially allocated to commercial vehicle owners were assumed to be shifted forward to consumers in the form of higher prices. Thus, these revenues were distributed by line 38, "total consumption", Table B1. The Ontario motor vehicle licences allocated to private passenger vehicle owners were distributed by line 23, "automobile purchases", Table B1. This distributive series of automobile purchases is imperfectly related to motor vehicle licences, but there appears to be no superior alternative. The gasoline tax receipts allocated to private passenger vehicle owners were distributed by line 24, "automobile operating expenditures", Table B1. This series is also somewhat imperfectly related to gasoline purchases but since gasoline purchases form a high proportion of total automobile operating expenditures the error is not likely to be large.

Line 5: Excise taxes: This total includes receipts from the hospitals tax, pari-mutuel tax and liquor profits and licences. The receipts from the hospitals tax and the pari-mutuel levy were distributed by line 34, "expenditures on movies, plays, concerts and sports events", Table B1. The revenues from liquor licences and liquor profits were distributed by line 32, Table B1.

Lines 6 and 21: Succession duties, estate tax: Both the succession duties and the estate tax receipts were allocated to the highest income class on the basis of the reasoning described in Chapter 3.

Lines 7 and 29: Natural-resource revenue: This total includes three types of revenue. The revenues that were deemed similar to profits taxes were distributed by line 14, Table B1. The revenues classified as sales taxes were distributed by line 38, Table B1. The remaining category of revenue includes such items as fishing and hunting licences, camping permits and other charges to those using provincial land for recreational purposes. This last category of revenue was distributed by line 35, "expenditures on equipment, fees and licences for sports", Table B1.

Lines 8 and 22: Social insurance contributions: The provincial items included were workmen's compensation, industrial employee vacations and public service pensions. At the federal level public service pensions and unemployment payments were included. One-half of the workmen's compensation, industrial employee vacations and public service pensions and three-fourths of the unemployment tax receipts were distributed by line 1, "wages and salaries", Table B1. One-half of the workmen's compensation, industrial employee vacations and one-fourth of the unemployment tax payments were allocated by line 38, "total consumption", Table B1. As discussed in Chapter 3, the public service pensions deemed to be borne by the government were not included because they were covered by other tax receipts.

Line 9: Hospital premiums: This total was distributed by line 22, Table B1.

Lines 10, 14, 24 and 30: Other taxes and miscellaneous revenue: Most of the revenue in this category was classified as miscellaneous revenue and was distributed by line 39, Table B1. However, there were some minor provincial taxes, such as the fire marshals tax, and the land transfer tax, which were assumed to be borne in proportion to property assessment (line 41), and the security transfer tax, which was distributed by line 14, Table B1.

Line 11: Total provincial revenues: This total was obtained by summing lines 1 through 10.

Lines 12 and 28: Property tax: The Ontario tax includes seven categories: tax on owner-occupied residential housing, tax on rented housing paid by renters, tax on rented housing paid by owners, tax on business paid by consumers, tax on business paid by owners, tax on farms paid by consumers of food, tax on farms paid by owners. The first category was distributed by line 17, Table B1. The second category was distributed by line 19, Table B1. The total of the third category was distributed by line 20, Table B1. The fourth item was distributed by line 38, Table B1. The total of the fifth category was distributed by line 14, Table B1. The total of the sixth category was distributed by line 30, Table B1. The total of the seventh and last category was distributed by line 42, Table B1. The property taxes levied by the other provinces accrued to Ontario residents as owners of firms which were located in other provinces and as consumers of products which were produced or grown in other provinces. These categories are identical to categories 4, 5 and 6 described above and were allocated in a similar manner.

Line 13: Business Tax: Line 13 was distributed by line 40, Table B1.

Line 15: Total municipal revenue: This line was obtained by summing lines 12 through 14.

Line 16: Total provincial and municipal revenue: This line was obtained by adding lines 11 and 15.

Line 19: General sales tax: This total was distributed by line 37, Table B1.

Line 20: Other excises: This total includes tobacco, alcohol and automobile excises. The tobacco tax receipts were distributed by line 33, Table B1. The receipts

from alcohol or liquor were distributed by line 32, Table B1, and the excise tax receipts from automobiles were distributed by line 23, Table B1.

Line 23: Import duties: This total was distributed by line 38, Table B1.

Line 25: Total federal revenues: This total was obtained by summing lines 17 through 24.

Line 31: Total other provincial and municipal revenues: This line was obtained by summing lines 26 through 30.

Line 32: Total revenue for all levels of government: This line was obtained by summing lines 16, 25 and 31.

TABLE 3:4

All of the figures in Table 3:4 were obtained by dividing, line by line, each of the items in the first eight columns of Table 3:3 by line 26 of Table 2:1. The only exceptions to this procedure were the alternative calculations shown at the bottom of Table 3:4. For the first item, "Ontario corporation tax 100 per cent shifting", the total corporation tax accruing to Ontario residents was distributed by line 38, Table B1, and then divided by line 26, Table 2:1. For the "Ontario corporation tax, zero shifting", the entire tax accruing to Ontario residents was distributed by line 14, Table B1, and divided by line 26, Table 2:1. The item "Ontario sales tax 100 per cent on factor incomes" was distributed by line 21, Table B1 and divided by line 26, Table 2:1.

TABLE 4:1

Table 4:1 is derived in much the same way as Table 3:1. The primary sources of data for this table were *Financial Statistics of the Government of Canada 1961*, *Financial Statistics of Provincial Governments 1961* and *Financial Statistics of Municipal Governments 1961*. In addition to these sources, some use was made of data provided by the *National Accounts*. The major differences between our table and the tables found in the government documents are: (1) we have included some expenditures such as unemployment compensation that are payable from government trust funds; (2) intergovernmental transfers are not included in our table; and (3) we have regrouped many of the items into categories convenient for our analyses.

Line 1: Highways, roads and bridges: The totals were obtained from the above-mentioned documents. For municipal expenditures 85 per cent of the expenditures on public works were allocated to highways, roads and streets. For the users' portion, the Ontario share of these expenditures was determined in the same manner as the motor vehicle revenue shares. This means that we assumed that non-residents of the province received 59 per cent of the benefits that accrued initially to commercial vehicle owners and 20 per cent of the benefits that accrued to owners of private passenger vehicles. We also assumed that 25 per cent of the benefits that accrued to property owners were received by non-residents. The Ontario shares of the federal and other provincial and municipal expenditures were obtained in a similar manner.

Line 2: Other transportation and communication: This total was obtained from F.S.G.C. and it was assumed that one-half of these expenditures accrued to businesses and one-half to individuals. The portion allocated to businesses was distributed in the same manner as a tax on total consumption, and the portion that accrued to individuals was allocated to each province in proportion to expenditure on travel in the province to total Canadian expenditure on transportation. Transportation expenditure data were obtained from U.E.S.

Line 3: Education: These totals were taken from the government documents mentioned above and include expenditures on primary and secondary education, higher education, education of Eskimos and Indians and vocational training. For purposes of allocating some of the federal expenditure to Ontario, we placed the federal expenditures in two categories: higher education and all other. The Ontario share of the federal expenditures on higher education was obtained by multiplying the Canadian total by the ratio of income in Ontario to income in Canada. The Ontario share of all other federal expenditures was obtained by multiplying the Canadian total by the ratio of the number of children under 16 in Ontario to the number of children under 16 in all Canada. The provincial and municipal expenditures were allocated between the two categories in the government documents.

Line 4: Health and sanitation: These totals were obtained from the above-mentioned government documents. The Ontario share of the federal expenditures in this category was obtained by first placing the federal expenditures in two categories: (1) one-half the general health expenditures; (2) one-half the general health expenditures plus the expenditures on hospital care. The Ontario share of the first category was determined by multiplying the total by the ratio of the number of families and unattached individuals in Ontario to the total number of families and unattached individuals in Canada. The Ontario share of the second category was obtained by multiplying the total by the ratio of the population of Ontario to the population of Canada. The Ontario share of the municipal expenditures on sanitation (both Ontario municipalities and the municipalities of other provinces) was obtained by distributing the sanitation expenditures in proportion to non-farm property tax assessment and using the same incidence assumptions that were employed in distributing the property tax.

Line 5: Interest payments: The totals were obtained from the government documents mentioned above and the allocation of the payments is discussed in connection with Table 4:4.

Line 6: Social welfare payments: These totals represent the sum of the payments given in the government documents mentioned above and the payments made from government trust funds. The allocation of these payments is deferred to the discussion of Table 4:5.

Line 7: Agricultural expenditures: The totals are from the government documents mentioned above and the federal expenditures are placed in two categories for the purpose of allocating them by province. The two categories are expendi-

tures that are related to the number of farmers and expenditures that are related to farm income. The Ontario share of the first category was obtained by multiplying the total federal expenditures in this category by the ratio of the number of farmers in Ontario to the total number of farmers. The Ontario share of the second category was obtained by multiplying the total by the ratio of farm income in Ontario to total Canadian farm income. The source for the number of farmers is the 1961 census. The source for farm income is N.A.

Line 8: General expenditure: This category includes many diverse items and, as mentioned in the text, it was difficult to decide how to distribute these expenditures. We arrived at a compromise solution that involved allocating one-fourth of the expenditures according to dividend income, one-fourth according to family income, one-fourth according to the number of families and unattached individuals and one-fourth according to the number of individuals. The Ontario share of the federal expenditures was obtained by placing the federal expenditures in four categories and multiplying each of these four totals by the ratio of the Ontario amount to the total Canadian amount. Some of the Ontario general expenditures were allocated to non-residents and some of the expenditures of the other provinces were allocated to Ontario residents because one-fourth of the expenditures was distributed in the same manner as dividend income.

Line 9: Total: Line 9 was obtained by summing lines 1 through 8.

TABLE 4:2

The data for Table 4:2 were obtained from the three government documents discussed in connection with Table 4:1, and the methods of allocation were discussed in line 3 of that table.

TABLE 4:3

Table 4:3 was obtained from the three government documents mentioned in connection with Table 4:1 and the methods of allocation were discussed in line 4 of that table.

TABLE 4:4

In compiling this table we assumed that interest payments were proportional to debt holdings. Our first step was to subtract the portion paid directly to non-residents of Canada for all three government levels. Five per cent of the federal interest payments, 22 per cent of the provincial payments and 27 per cent of the municipal payments were directly allocated to non-residents. The remainder of the interest payments was divided into four categories: individual, savings institutions, charter banks and non-financial corporations, and insurance companies. As mentioned in the text, the interest payments paid by each government to itself or other governments were omitted from the analysis.

Line 1: Federal interest payments: The total interest received by individuals and savings institutions was multiplied by the ratio of liquid assets held in Ontario to liquid assets held in all of Canada to obtain the Ontario share of these payments. The interest payments made to chartered banks and non-financial corporations were treated in the same manner as retained earnings. This means that 34 per cent of the payments was first allocated to foreigners and approximately 46 per cent of the remainder was allocated to Ontario. The interest received by insurance companies was treated in the same manner as the tax on insurance premiums. Eighteen per cent of these payments was allocated to non-residents and approximately 37 per cent of the remainder allocated to Ontario.

Lines 2-4: Provincial, municipal and other provincial and municipal: For the Ontario provincial and municipal payments, 50 per cent of the interest allocated to individuals and savings institutions was allocated to the province, and after subtracting the foreign share of the interest received by the chartered banks, non-financial corporations and insurance companies, 50 per cent of the remainder was allocated to Ontario. For the other provincial and municipal payments, 42 per cent of the individual and savings institutions share and 42 per cent of the chartered banks, non-financial corporations and 37 per cent of the insurance companies share (Canadian portion) were allocated to Ontario.

Line 5: Total interest payments: This line was obtained by summing lines 1 through 4.

TABLE 4:5

Line 1: Old age benefits: The provincial amount was obtained directly from F.S.P.G. and the Ontario share of the federal payments was obtained from N.A.

Line 2: Government pensions: The provincial, municipal and Ontario share of federal payments were obtained from N.A.

Line 3: Family allowances: The Ontario share of the federal payments was obtained from N.A.

Line 4: Benefits to labour: The provincial items in this category include payments to the unemployed and unemployables, workmen's compensation, industrial vacation payments and miscellaneous benefits to labour. All of these were obtained directly from F.S.P.G. except for the workmen's compensation payments. The total for Ontario was obtained from Professor Gillespie's total for all of Canada by multiplying the Canadian amount by the ratio of families and individuals in Ontario to families and individuals in all Canada. The Ontario share of federal payments to labour includes unemployment payments and services supplied by the National Employment Office. The transfer portion was obtained from N.A. and the service component was multiplied by the total for all of Canada obtained from Professor Gillespie by the ratio of families and individuals in Ontario to the ratio of families and individuals in Canada.

Line 5: Veterans' benefits: This category includes both direct transfer payments and services such as hospital services supplied to veterans. For both components the totals were obtained from Professor Gillespie and the Ontario share of these totals was obtained by multiplying the Canadian total by the ratio of families and individuals in Ontario to families and individuals in Canada.

Line 6: Miscellaneous transfers: The provincial and municipal amounts were obtained directly from F.S.P.G. and F.S.M.G. The Ontario share of the federal miscellaneous payments was obtained by multiplying the total obtained from Professor Gillespie by the ratio of families and individuals in Ontario to families and individuals in Canada.

Line 7: Total expenditures: This line was obtained by summing lines 1 through 6.

TABLE 4:6

The totals for Table 4:6 were obtained directly from Table 4:1.

Lines 1, 9, 17 and 26: Highways, roads and bridges: The portion of these benefits allocated to owners of passenger vehicles was distributed by line 24, Table B1. The portion initially received by owners of commercial vehicles but then assumed to be shifted forward to consumers was distributed by line 38, Table B1. The portion allocated to property owners was distributed by line 41, Table B1.

Lines 2, 10 and 19: Education: The portions of these benefits allocated to elementary and secondary education and to miscellaneous educational services, such as educating Eskimos and Indians and vocational training, were allocated by line 25, Table B1. The remaining portion of the education expenditures, which was allocated to higher education, was distributed by line 26, Table B1.

Lines 3, 11, 20 and 27: Health and sanitation: The expenditures classified as general health expenditures were allocated by line 9, Table B1. The expenditures classified as hospital care expenditures were distributed by line 27, Table B1. The expenditures classified as sanitation were distributed on the basis of non-farm assessment.

Lines 4, 12, 21 and 28: Interest: The interest payments allocated to individuals and savings institutions were allocated by line 15, Table B1. The payments allocated to chartered banks and non-financial corporations were allocated by line 14, Table B1. The interest payments allocated to insurance companies were distributed by line 16, Table B1.

Lines 5, 13 and 22: Payments to the aged: Payments to the aged were distributed by lines 6 and 7, Table B1. Government pensions were distributed according to line 10, Table B1. Family allowances were distributed by line 5, Table B1. The service component of veterans' benefits was distributed by line 28, Table B1. The services provided by the National Employment Service were distributed by line 9, Table B1. Industrial employees' vacations were distributed by line 1, Table B1. Unemployment benefits, payments to veterans and workmen's compensation payments and miscellaneous transfer payments were distributed by line 7, Table B1.

- Lines 6 and 23: Agriculture:* General agriculture expenditures were distributed by line 11, Table B1. Agriculture expenditures that were deemed to accrue to farmers in proportion to their income were distributed by line 12, Table B1.
- Lines 7, 14, 24 and 29: General expenditures:* The expenditures that were deemed to benefit all individuals equally were distributed by line 27, Table B1. Expenditures allocated to families and unattached individuals were distributed by line 9, Table B1. Expenditures allocated to families in proportion to their income were distributed by line 8, Table B1. Expenditures allocated to families in proportion to their investment income were distributed by line 14, Table B1.
- Line 18: Other transportation:* The expenditures allocated directly to individuals were distributed by line 29, Table B1. The rates of the expenditures allocated initially to firms but assumed to be shifted forward to families were distributed by line 38, Table B1.
- Line 8: Total provincial expenditures:* This line was obtained by summing lines 1 through 7.
- Line 15: Total municipal expenditures:* This line was obtained by summing lines 9 through 14.
- Line 16: Total provincial and municipal expenditures:* This line was obtained by summing lines 8 and 15.
- Line 25: Total federal expenditures:* This line was obtained by summing lines 17 through 24.
- Line 30: Total other provincial and municipal expenditures:* This line was obtained by summing lines 26 through 29.
- Line 31: Total expenditures for all levels of government:* This line was obtained by summing lines 16, 25 and 30.

TABLE 4:7

All of the statistics in this table were computed by dividing the lines in Table 4:6 by line 26, Table 2:1.

TABLE 5:1

The statistics under Alternative I were obtained by subtracting the relevant lines in Table 3:4 from the relevant lines in Table 4:7. The statistics given under Alternative II were obtained by first increasing all of the relevant revenue rates by 11 per cent and then subtracting these lines from the relevant lines in Table 4:7. The statistics listed under Alternative III were obtained by increasing the relevant provincial revenue rates (given in Table 3:4) by 19 per cent, increasing the municipal rates by 65 per cent, reducing the federal revenue rates by 7 per cent and reducing the other provincial and municipal revenue rates by approximately 60 per cent, and then subtracting these lines from the relevant lines in Table 4:7.

